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A SALARIED STATE MEDICAL SERVICE.[1]

By SIR RAPHAEL CILENTO,
Brisbane.

THE opinions expressed in this address are my personal opinions. They do not claim to be opinions accepted by the Government I serve or by any Minister of the Crown. They are elaborations of my representations to the National Health and Medical Research Council of the Commonwealth over a period of years.

At the final session of the (former) Federal Health Council of Australia, which met in Perth, Western Australia, in September, 1936, I undertook to prepare, for early discussion, an address upon the increasing intrusion of public into private medicine, and particularly upon its invasion of the public hospital, formerly the province of the indigent poor and the honorary medical practitioner and specialist.

My paper on this subject was submitted at the inaugural meeting of the Commonwealth National Health and Medical Research Council, which was held at Hobart, Tasmania, on February 2, 1937.

It was based upon the following postulate:

The relation of the public, the practitioner, the hospital services and the State is essentially a reflex of the economic tendencies and difficulties of the time, for whenever economic factors provide a stalemate, a new equilibrium must be found . . . Social amelioration is invariably a matter of broad and placatory measures which avoid the essentials of the situation (these, indeed, are often beyond correction) and seek compromises comforting to the individual desire for protection and security . . . Obvious and inevitable tendencies are those towards free public medical services, propaganda for population conservation and direct State intervention in food economics—the essentials, it will be observed, of individual survival and national survival.

I went on to advocate a free public medical service on the ground that we were actually passing through such an economic crisis, and that, however undesirable it might be considered by the more conservative, the change to State control was inevitable, and since inevitable, one that should impel the medical profession to see that it was guided by professional hands in the interests of the community and not left to the enthusiastic but necessarily partly informed activity of laymen.

My address to the Council was rejected for publication by a large majority vote.

Following this rebuff in Tasmania (where the State medical service for outposts proposed by Dr. J. Gaha, Minister for Health, was meeting with strong opposition) I distributed to the medical profession in Queensland an "open letter" and a *questionnaire*. A record number of medical practitioners—more than 99% of the profession—replied to this *questionnaire*; 97% expressed their willingness to be associated with the Government in a State-controlled service (nearly 30%, in response to a circular sent out by the Queensland Branch of the British Medical Association, qualified their consent by stating that it was conditional upon any terms and conditions made by the Branch); while 69% of the medical profession were willing to accept unconditional employment in a State service.

This letter, which consisted largely of excerpts from the address given by me in Tasmania, was attacked by the medical Press in a way that is now chiefly interesting because of the demonstration it gives of the great change

[1] Read at a meeting of the Queensland Branch of the British Medical Association on February 6, 1942.

in opinion that has occurred in the views of the profession itself within five years. It has been a fundamental change.

It was recently said, indeed, with a fair degree of truth, that there is no longer any question as to whether there will be State control of medical care—it is now only a question of what form it will take. I believe that this is true. It is in my opinion the natural and inevitable conclusion from the trend of public opinion during the last twenty-five years throughout our whole civilization.

Surely it is not for nothing that there has been a demand for State control of medical practice in almost every European country during the present century. Is it not especially significant also that this movement has found strong expression in England and in other countries that have tried the half-measure of national insurance? It is, as a commentator recently pointed out in *The British Medical Journal*, "the failure of national health insurance that is the cause of the present clamour raised for a State medical service in England".

Behind and beyond the various compromises that have been advanced to withstand such a salaried scheme there is the mighty urge of social thought which makes all men its puppets. Think what we may, we are governed ultimately by the social concepts of our time.

Dr. Parran, now Surgeon-General in the United States of America, in 1934 made the following statement:

> The direction and distance we can lead towards a specific type of health service for tomorrow is limited sharply by the framework of tomorrow's social concepts . . . It is no longer easy to secure applause by damning the government because of its interference, without valid evidence that alone and unaided by government we can do a better job . . . What happens to our present public health system or to the private practice of medicine, as we know them both today, will not be determined by the resolutions of medical societies, nor yet by the recommendations of health officers . . . Whatever the path we take, regardless of how earnestly as doctors we may fight for it or against it, the health service of tomorrow inevitably will conform to whatever is the governmental framework.

Dr. Sigerist, of Baltimore, said the same age-old thing in other words:

> There is one lesson that can be derived from history. It is this: that the physician's position in society is never determined by the physician himself, but by the society he is serving. We can oppose the development; we can retard it—but we will be unable to stop it.

The conservatism of the medical man is at once his safeguard and his handicap. He cannot, for the sake of the service he owes the public, accept any change in theory or practice until it is almost over-abundantly proved. As a consequence he is sometimes with the best of intentions forced to subscribe to an idea that has already become an anachronism.

The minute-hand of Time has crept across the face of medical practice so slowly that its progress has not been remarked; but if one compares the present with the situation even one generation ago, not only is the change fundamental, but the consequences must be accepted as fundamental also.

Dr. Bossard, Professor of Sociology at the University of Pennsylvania, in 1934 aptly traced some of the stages in the process, as follows:

> Time was when health, sickness and the work of the doctors were regarded almost entirely from an individual viewpoint. With the exception of grave crises resulting from widespread epidemics, there was little, if any, conception of the social aspects or significance of health problems or health services. This attitude was the product largely of our isolated manner of living and our earlier individualistic philosophy . . .

But there have been vital sociological changes:

> The first of these has been the development of health work in schools . . .
>
> To physical examination have been added: follow-up work for the correction of defects, systematic immunisation against communicable diseases, the improvement of school sanitation, provision for the safety of children, and, in many cities, nutrition work involving the actual feeding of under-nourished children. In other words, there has grown up now a generation who, through the schools, have become accustomed to a reasonably adequate and free health service . . .
>
> Profiting by the experience of the past, modern military leaders, with the aid of medical men, have made their armies an example and an inspiration for our public health authorities in time of peace, for disease is today controlled far more effectively in the camp than in the market place. This was particularly true during the World War (1914-18), with the result that millions of young men who had become accustomed to a partial and free health service in the schools, had that experience continued and enlarged in the more effective health service which they received while members of the military forces.
>
> After demobilization these men went into industry, and here again the same sort of development has been going on. More than twenty years ago the larger corporations began rendering health services to their employees . . .
>
> Most significant of all, perhaps, has been the marked tendency to provide not only for the worker, but for members of his family as well . . .
>
> A fourth factor in the creation of the present attitude toward health and health services has been the growing participation of organised government in health work . . .

Governmental participation in medical work is a much larger story, however:

> It includes the work of some 25 agencies in the federal government, chief among which is the United States Public Health Service, the separate State departments of health, and our city departments. It includes the diagnostic laboratories of the States and cities; the manufacture and distribution of biologicals; the operation of various governmental clinics; . . . and finally the rapidly increasing number of Federal, State, country and city hospitals. Few citizens realise the extent to which the provision of hospital facilities has become a public service. In 1931, 73 per cent of all hospital service in the United States was provided by governmental agencies.
>
> Finally, in this brief summary of governmental participation in health work, mention must be made of the work done in the field of infant mortality, and the program of combating venereal disease.
>
> Bringing all these developments together, it appears that in school, in military service, in industry, and through governmental agencies we have developed an organised, effective, socialised medical and health service, gratuitously given to a large proportion of our population . . . What has been happening logically and inevitably has been a "carry-over", to the end that these experiences in school, army and workshop have led to the creation of a new social attitude toward health and health services.

These factors are as active and important in Australia and among other nations as they have been in the United States of America—in some instances, indeed, Australia was first in the field. As medical men, however, this "new social attitude toward health and health services" profoundly affects our economic security if medical practice is to be continued along lines adapted to the social organization of last century.

I agree with the statement of the Queensland Branch of the British Medical Association that 80% of the people are unable to pay for a full medical service; those who can pay something are increasingly unwilling to do so; and the costs of providing medical care and up-to-date diagnostic facilities are steadily rising; while the net return to the practitioner, viewed as income, is steadily falling. We have for a long time been faced by the fact that the lower the income, the higher the sickness rate. Efforts to meet this paradox resulted in a great growth of public hospitals, which, as they have developed, have ceased to be hospitals for the indigent and have become available to all classes. While their scope has widened, the field available to medical men has been continuously restricted during the present century. Medical practitioners long ago abandoned to the State the care of patients suffering from acute infectious diseases, except the minor exanthemata, and from diseases involving long-continued after-care, such as poliomyelitis. We lost dentistry and as much of the surgery of the head and neck as is related to it, when that part of medicine was elevated to independent status. Midwifery is becoming largely the province of the public hospital and the trained midwifery nurse. Dietetics in general, and infant feeding in particular, are falling more and more into the hands of trained welfare nurses and of laymen. The sale of the medicines we prescribe (once very

largely the whole basis of professional work) has been lost to the pharmacist, and as a matter of fact not only has the doctor ceased to compound prescriptions, but there is a new empiricism in medicine which leads practitioners to rely more and more for their drugs (and for their impressions of their therapeutic value) upon firms that market proprietary preparations. Furthermore, specialization in ancillary activities, both therapeutic and diagnostic, has provided an assured place for the radiological and laboratory technician, the masseuse, and the social welfare worker; and each of these aspects is growing up divergent from the parent stem to become a specialty, and before long, perhaps, to follow dentistry and pharmacy to independent status divorced from medical practice proper.

Within the medical profession itself there has been an ever-increasing tendency to specialization as the content of medicine has become ever more detailed and as competition between medical men has become ever more keen. Of the 36,000 practitioners registered in Great Britain, only 26,000 (roughly two out of three) are general practitioners. Uncoordinated specialization is shattering the profession.

Competition, moreover, has made it necessary to save time, and the old leisurely individualistic routine has given place to consultation at set office hours at the professional rooms of the doctor, with the diversion of all surgical, most obstetric and many medical cases to private or to public hospitals. Medical men state that they fear a loss of individualistic practice. Why? In this sense it has been dead for thirty years, and only its tradition remains.

Unless the medicine of the future can reorganize all aspects of medical care and coordinate them under medical control—unless, in other words, medical care can be reintegrated, reorganized, freed of its extravagances and duplications and protected against continued assaults upon those of its aspects that seem for the moment to yield the readiest monetary harvest—medical practice, as we know it, will destroy itself, and in its destruction will give entrance (as it is at present doing) to a thousand forms of quasi-medical quackery.

With an uncoordinated system, medical men, whose training is intended to make them professional men who are at least quasi-scientists, are forced to become mere business men engaged in competitive business for profit within certain legal restrictions and under self-imposed ethical limitations. They find their greatest opportunity, as other business men do, among well-to-do purchasers. Anyone who will but glance at a map showing the distribution of medical men in accordance with population, will be struck by the great difference between the large number engaged in practice among the affluent and the relatively small number working among the indigent sections of the community.

The distribution of medical care, therefore, also needs to be organized in terms of national necessity; but how can this be where medical men must compete with one another for a livelihood among those best able to pay?

Blackstone (1723-1780), the greatest of the English commentators on the law, made the following statement:

> The right to the enjoyment of health is a subdivision of the right to personal liberty—one of the absolute rights of persons.

Yet this right of the individual must be sacrificed to the necessity of the medical man to make a living. By what right does anyone demand that a young medical graduate, who by labour and sweat has attained his medical degrees, must pay or plot or fawn for the right to work at his calling in a way that will provide him with an income equal to his needs?

Individualistic medical practice is no exception to the handicrafts which were aptly described by Bryan Monahan (quoting Henri Pirenne) in THE MEDICAL JOURNAL OF AUSTRALIA of December 27, 1941, in the following terms:

> As they [the handicrafts] evolved, the two essential features of their constitution—monopoly and privilege—became more and more prominent . . . The admission of new members was made more and more difficult; apprenticeship became more protracted and more exacting; promotion to the rank of master became more costly so that the poor journeyman could hardly hope to achieve it . . . The original spirit of fraternity was replaced, among the craftsmen, by an increasing opposition of interest between the masters and the journeymen.

Medical care is an essential—the intensity of the national economic struggle is such that national survival depends essentially upon the economic efficiency and the productive capacity of the nation as a unit—and because medical care is an essential, the economic security of the medical men who profess it should be guaranteed by the nation in the national interest. It is readily accepted that professors of medicine and other medical teachers should be paid at a rate that permits them to be engaged in the essential activity of training men for graduation, and yet, when these men are trained, they are tossed extravagantly into the economic whirlpool to sink or swim as may be; some of the best and some of the worst of them to make their fortunes by skill or bedside manner; some of the best and some of the worst of them to live on the edge of bankruptcy; and the medical profession as a whole to be taunted by the envious, the disillusioned or the unserviced with "commercialism". Moreover, the present-day complexity of medical care has made it impossible for any one man to become expert in every line of medical work, or even by reading to keep himself fully informed on all aspects. There is only one way to meet this difficulty, and that is by team work, by a combination between groups of men who between them cooperatively cover the whole field of medicine.

This is group practice. It exists in hospitals, because hospitals must meet every demand, and it has been developed to some extent in medical practice, to the very great advantage of both patient and practitioner. Where it is complete, it obviously is that reintegration of medical practice to which I referred just now as the essential (and the ideal), if medicine is to be saved, as a profession, from catastrophe.

To integrate the profession again, to arrange for the proper distribution of medical men in terms of medical needs, to organize, to provide facilities for research, and to give economic security to every member of the medical profession, is a task too great and too important to entrust to any authority less than the State.

It is for that reason that I recommended a State salaried service.

These considerations, frequently debated, led at the end of 1940 to a proposal that the discussion which had ended so ineffectively in Tasmania should be revived in Canberra at the next meeting of the National Health and Medical Research Council. Early 1941 found general medical opinion, as evidenced by the Councillors, greatly changed from that of early 1937. It was no longer considered absurd to say that unless medical men could successfully demonstrate their sincerity and their ability to advise the Government by providing an altruistic workable medical plan, they would without doubt find imposed upon themselves and upon the public a scheme that might include some imperfections, some failure of balance, and possibly some lack of justice.

The Councillors set themselves from the representations before them to outline such proposals, and embodied them in the resolutions of the eleventh session. The Council's subcommittee, which was appointed to develop these recommendations in detail, placed before its twelfth session (November, 1941) the detailed scheme that has since appeared in THE MEDICAL JOURNAL OF AUSTRALIA of December 20, 1941.

These recommendations, though they are based on a salaried State medical service, have been heartily approved by large numbers of medical men, and have already been made the basis for at least two publications in New Zealand and in Great Britain.

The critical situation that has arisen in respect of the provision of medical services owing to the war gave these proposals their opportunity and their importance; the entry of Japan into the war has momentarily suspended their further consideration and has involved the institution of emergency measures.

As a nation, we are cursed with a casualness of outlook that accepts only the inevitable and begins to prepare when

the menace is at our gates. Already great numbers of medical practitioners had enlisted for full-time military duty; large numbers were employed on part-time war work; medical "pools" had been formed in the attempt to protect the financial interests of those who had gone to the war; and for the sake of their economic security, there had been introduced also into the by-laws of the British Medical Association in some (or all) of the States, prohibitions against the establishment of medical practice in any area without the prior consent of the local Branch; while State medical coordination committees, reporting to a central authority, are at present determining the immediate movements, and to some extent the future, of every medical practitioner in Australia. Finally, every medical man in Australia below the age of sixty years, has been selectively conscripted for the service of the State, on the recommendation, I understand, of the Director-General of Medical Services for the Department of the Army.

This is an attempt at the rationalization of the medical problem, and a tacit nationalization, but it is necessarily incomplete and clumsy. It has, however, one great aspect of value for the profession, because it provides an opportunity for the study of plans for the best all-inclusive medical scheme for the future, and it has awakened medical men to their opportunity (if they will seize it) of solving the problem along lines acceptable to the public, to the State, and to themselves.

Side by side with the paramount military demands, there have arisen new responsibilities in respect of civil defence, including epidemic precautions. For a generation there has been a growing association between the State and the medical profession; in Queensland, every practising medical man has certain duties to the State, which are increasing both in number and in importance. The certification of deaths, the notification of births in certain circumstances, the notification of infectious diseases, the isolation of infected persons and their subsequent release, cooperative arrangements in respect of ante-natal and post-natal clinics, maternal and child welfare services and school health services, the requirements of the *Workers' Compensation Acts*, medico-legal responsibilities, and many others, recall this widening range. This association is becoming closer and more permanent on account of the war.

Is it surprising that the National Health and Medical Research Council, in view of all these facts, recommended a salaried State medical service, Commonwealth-wide in its extent, and combined this recommendation with a trenchant criticism of the existing national insurance proposals? These, as has been mentioned previously, are a mere half-measure of compromise, the failure of which in England has been said with truth to be the reason for the demand in that country for a salaried State medical service.

The specific proposals for a State medical service on a salaried basis have already appeared in THE MEDICAL JOURNAL OF AUSTRALIA, and I have been asked to comment specially tonight upon the plan in so far as it affects general practice, omitting anything more than a passing reference to preventive medicine.

Ultimately the maintenance of health rather than the correction of defects due to its neglect must become the deliberate ideal of the State, and preventive and curative medicine must be correlated as essential parts of one scheme.

The Preventive or Protective Aspect of Medicine.

I shall content myself with stating briefly that, as an active process of preventive medicine, the maintenance of health includes, *inter alia*, medical publicity and propaganda; infant and maternal welfare work; school health services; physical education; general and specific measures for the protection of the public, which vary from the quarantine services to exclude morbid invaders, to immunization services against diphtheria and whooping cough; the meticulous examination of food and drugs; the general sanitation of environment; and campaigns against particular disease problems and possibilities.

This programme is almost wholly performed at present by the State, with an increasing cooperation provided, either freely or under statutory compulsion, by medical practitioners. It must become the major preoccupation of the profession; it cannot reach the public adequately while medical care is largely a business for profit uncoordinated by the State.

Stanley Boyd, in an admirable summary of the situation (THE MEDICAL JOURNAL OF AUSTRALIA, April 15, 1940), basing his remarks on long experience both of panel and of private practice, concludes that "we" (that is, medical men) "cannot be expected to take an interest in the building of health as long as we are being paid for the treatment of illness". In a subsequent article (THE MEDICAL JOURNAL OF AUSTRALIA, March 8, 1941), quoting Lord Moynihan, he emphasizes the fact, recognized by all of us, that the medicine of the future must be directed towards the prediction and prevention of pathological changes.

We are all aware that this must mean a change of outlook comparable to that which occurred when the aseptic technique took precedence over the antiseptic; and we are also all aware that such a programme would automatically imply State control of practice and medical care.

That a change in this direction is recognized, is obvious from the fact that medical journals are, at the moment, devoting belated attention to "medical sociology", which is merely a new name for old truths long neglected.

The present preventive medical programme in Australia is based upon the familiar system which delegates domestic responsibility to local authorities, with some degree of central direction from the State. Though the detail of the system differs in different States of the Commonwealth, "medical officers of health" and "government medical officers" are in all States charged with the essential local responsibilities in appropriate districts.

It is inevitable that the organization of the future will increase the obligations of local authorities by the inclusion of several other features of a more active programme of prevention, and will insist also upon a more deliberate programme of physical development and health maintenance for the individual as a routine matter. It is common sense to suppose that it will be done by an extension of existing means.

I shall leave this aspect, therefore, with this comment: the machinery that has been found valuable for meeting the needs of the State in preventive (that is, protective) medicine and in its public hospitals, is undoubtedly the machinery that will, in the first instance, be employed for providing to all the people who need it medical care of the curative type (that is, corrective medicine).

It was therefore natural that the best features of the public health system and of the hospital system together should have provided the basis for the resolutions of the eleventh and twelfth sessions of the National Health and Medical Research Council.

The Curative or Corrective Aspect of Medicine.

When protection has failed, and disease has consequently injured the tissues and organs, medical or surgical palliation is called for. It is in the curative side of medicine that you are all principally interested.

Rationalization of medical care in this regard involves, primarily, the proper distribution and availability of adequate medical services in accordance with national needs—the striking of a ratio, as it were, between supply and demand in accordance with the best procedure that can be devised for effective function.

Hospitals, public and private, now deal with some 75% of patients whose illnesses last for eight days or more, and with a vastly increased number at out-patient departments.

For a generation public and private hospitals have run parallel and auxiliary services, but the public hospital, financially secure, has grown at the expense of the private hospital. The public hospital financed from revenue, or from rates, or from both, has outpaced the public hospital dependent on voluntary subscriptions. The tendency, therefore, is for the private hospital to give place altogether to public hospitals financed from revenue and to hospitals partly voluntary and partly maintained by State subsidy. Each of these types is increasingly including paying

patients of the so-called "intermediate" class. It is on such hospitals as pegs, I believe, that any proposed salaried State medical service must hang for support.

Australia has a grossly centralized population. Considerably more than half of it is in the six capital cities of the States. From these, it thins rapidly away along lines of transport to pioneer fringes. There are outpost areas where there is not enough practice to keep a private practitioner alive, yet where the pioneers, who are carrying further the conquest of the interior, are more than usually liable to accident and illness, and are well deserving of medical provision. These areas are called in the National Health and Medical Research Council's scheme "A Class Areas".

There are, then, those great sections of the country dotted with hospitals, varying from the cottage hospital with a daily in-patient rate of two or three, to the local hospitals with daily in-patient rates up to 40; these are "B Class Areas". Many of these areas are one-man towns; many of them have two or more men competing for the practice of the district. It is in these areas that the State and the private practitioner come most commonly into conflict. The Government or hospital board, which has built or subsidized the hospital, insists that it shall be the principal consideration of the medical man (who may merely be attached to it on a part-time basis for a fee). It requires that he shall treat there a large number of people who are unable or unwilling to pay private fees. The doctor, on the other hand, regarding himself as a free agent, is (quite naturally) chiefly concerned with his private practice.

As development proceeds and friction grows, the hospital board may appoint a full-time medical man to the hospital, and the private practitioner may find it difficult to secure a livelihood; but the hospital officer may find it difficult, after the private practitioner is defeated, to visit patients in their homes. These Pyrrhic victories benefit no one.

Where the district is widely scattered or where the town is somewhat larger, very difficult situations may, and often do, hinder public welfare for years.

Areas called "Class C Areas" are considerably more complex.

Australia, originally a country largely of primary producers, but now in a transitional stage, has concentrated its country population in groups of towns along its highways. In each of these district collections, there is some large town or common centre with a hospital of the C Class category. Round the main town are sprinkled the smaller towns, to which I have referred as B Class, and the outpost villages, railway sidings *et cetera*, mentioned as A Class.

These larger towns, with their hospitals having a daily in-patient rate of 40 to 50, often carry a greater number of doctors than their size would seem to justify, because, in effect, they are the intermediate consultation centres for the whole of the area and for medical men practising further out. It is at such towns that the out-patient problem first begins to be a considerable one. Such hospital areas deserve the name of auxiliary base hospitals, and as has been mentioned, lie scattered along transport routes at focal points. Although they are largely self-contained, they, too, are ultimately related to a few much larger centres in provincial cities—the "D Class Areas".

In these large provincial cities we find not only all the provision for medical care, but a commencing proportion of specialists and also of men who, while continuing in general practice, devote their time increasingly to one type of case.

These four types of areas, from outpost siding to provincial city, constitute "country practice" as opposed to "city practice". Some of the provincial cities present both types.

In the capital cities themselves, there are the great public hospitals with their more or less closed systems and their huge out-patient departments; there are concentrations of medical men in the richer quarters of the cities, and a sprinkling of them in the poorer quarters; there are large private hospitals financed by companies or related to religious institutions; there are many small private hospitals often owned or part-owned by doctors; one-third, or more than one-third, of the doctors specialize to some degree; and the outstanding characteristic of practice is keen competition—the competition that results in a great waste of capital or earnings for overhead expenses. Figures from the United States of America suggest that it varies from 25% to 40% of the total.

It is commonly stated that no new man may seek to break into private practice in the cities except by direct purchase, by partnership, or by a pigheadedness that is proof against several years' starvation!

You are familiar with the descriptions of these areas, the towns included in them, and the methods proposed for their coordinated control, from the detailed recommendations published on December 20, 1941.

The future of the salaried medical officer may be briefly recalled to your recollection. The salaried State service proposals intend that on graduation every medical practitioner shall spend one year in hospital as a junior resident medical officer at a salary of £150 *per annum*, with board and lodging. His second year should be spent either in hospital as a senior resident medical officer or as a reliever, or in attachment to one of the "D Class Centres" shortly to be described (in a capital city or provincial city). The salary suggested for this year is £300 with board and lodging, or £400 *per annum* without it.

During his third and fourth years, the medical practitioner would carry on general practice at A Class centres—that is to say, as medical official at an outpost area; or at a B Class centre—that is to say, at some small town with a hospital having a daily in-patient rate of from four to five to ten; or as a junior in the larger hospitals (still of the B Class—that is to say, with a daily in-patient rate of up to 40). The staff at such hospitals will vary from one to four men (senior in charge as medical superintendent).

The recommended salary at this stage commences at £700 *per annum* and rises by annual increments of £50.

If a man chooses to remain in such a place, or if his capacities go no further, his maximum salary is £900 *per annum*, which will be reached in five years. But there are also allowances apart from board and lodging. In A Class centres and in B Class centres, it is necessary to carry out night work and domiciliary visiting, and for this an extra allowance of £104 *per annum* is made to a man at a one-man post, with *pro rata* payments for any lesser responsibility at larger hospitals (£2 per week) if this work is shared.

After two years in a B Class area—that is to say, four years after graduation—medical men may apply for transfers. It is at the end of the fourth year that a man's capacities will usually have been demonstrated, and no man can commence to specialize before his fifth year after graduation. If he has, however, shown capacities in that direction, he may, if approved, commence as a "junior specialist in training" in his fifth year. Alternatively, he may continue as a "junior general practitioner"; and any man who so desires or has private funds can go into private practice.

Junior general practitioners who continue in the service of B Class, and ultimately of C and D Class stations, can progress by effluxion of time and demonstration of efficiency to the classification of "senior general practitioner". The criteria are capacity, recognition by brother practitioners and popularity amongst the public, as evidenced by demands made for the personal services of these practitioners.

"Junior general practitioners" are classified at salary ranges rising by increments of £50 *per annum* to reach £1,100, with allowances for night work where it is necessary. "Senior general practitioners" continue to a rate greater by £500 *per annum*.

Juniors in training for specialty practice gain nothing in salary; their salary rate is the same as that of a "junior general practitioner". They actually lose in allowances by having no part in the £104 *per annum* available to any man who does night work. Like "junior general practitioners", their income rises to £1,100 by annual increments of £50;

but when they reach the stage of "junior responsible specialist", which indicates a successful period of four or five years' training in their specialty (that is to say, nine to ten years after graduation), they are admissible to specialist registration, and their classification rises by similar increments to £1,400.

A specialist remains at that stage until he is admitted to senior status, which usually will not be until six further years have expired, and as a "senior responsible specialist" (salary range £1,500 to £1,800), he may aspire to become ultimately a "specialist consultant", at a maximum salary of £2,000 *per annum*.

The terms and conditions that are recommended for medical officers include three weeks' annual leave; those at outpost A Class stations and certain B class men receive four weeks' leave, of which one week must be spent under supervision at a larger C Class or D Class centre in order that their efficiency may be the subject of report by the medical group at that centre.

After every fifth year, each doctor up to the stage of "senior general practitioner" (that is, at least up to a stage beyond the sixteenth year of practice), will be eligible for three months' study leave; if he accepts this, he will be required to devote it to a specialist course of study. The results obtained from such a course will be available to determine preferment for any post in which they may be evidence of appropriate capacity.

At the age of sixty years the medical officer will be pensioned and will retire.

Under this system, very briefly and inadequately outlined, there would be a constant rotation of recent graduates in outpost stations; every man would receive at least four years' experience in general practice; specialization would be primarily in the interests of the public; all hospital areas would be staffed; and medical men would be offered economic security.

It is understood that the medical profession and its representatives are ready to concede that a salaried system should be approved for outpost places. When the first of such appointments was made in Tasmania, in 1938, they were strongly discountenanced and criticized; but experience has demonstrated in Tasmania, as it did with the Highlands and Islands Service in Scotland, that the system is a great improvement on anything previously operating there.

The arrangement by which A Class stations look to B Class stations for help, B Class stations to C Class stations, and these again to the base hospital centres or D Class stations, is admitted to be a good one, and merely puts upon a formal basis of authority what has for years been the usual practice amongst medical men wherever they are friendly.

Is it merely intended, then, that a State service should put existing practices on an official basis? No.

These proposals have one outstanding feature which is itself its foundation feature: in all areas in which there are several medical men, group practice is obligatory. In capital cities and in provincial cities it is the basis of practice in the three sets of institutions operating—namely, the central base hospital, the ring of auxiliary hospitals and the consultation centres of the suburbs.

The connecting link between the central base hospital, the ring of auxiliary hospitals and the consultation centres of the suburbs should, in each large town or city area, be a consultative squad of specialists.

In A Class centres and in small country hospitals of B Class, the one man in charge will do both hospital work and out-patient work, thus covering the whole field; in the larger centres of the B Class type there will be a tendency to separate out-patient work from hospital work, but in general the situation will not differ much from that existing at present, except that the work will be done upon a roster which includes all medical practitioners within the scheme; in C Class centres, the "consultation centre" begins to be more and more a separate organization, as does also the hospital with its full-time staff; and between them appears for the first time the "consultative squad", linking both activities.

In my opinion the central or base hospital legitimately includes within its functions all the specialties, and also where necessary the treatment of acute diseases, including casualty work, infectious diseases as a specialized activity, and midwifery and obstetrics, in so far as they are not provided for by private hospitals or domiciliary practice.

As to staff, I consider the present organization at the Brisbane Hospital a good one, with the addition of a standing committee of all full-time and part-time medical practitioners for monthly "medical audit" of cases, at which attendance is obligatory. I shall later make reference to such staff conferences at consultation centres.

The Consultation Centre.

The consultation centre is really a "regional health centre", and should become known as such to the people in the area it serves. One such centre should be established to serve approximately 30,000 people resident in that particular area or suburb, and it should be set up as nearly as possible where (i) population density, (ii) numerical frequency of health-hazards, (iii) convergence of transport and traffic routes and (iv) favourable relationship to auxiliary and base hospitals, coincide to indicate an ideal site.

The purpose of this consultation centre should be to correlate all the local clinics for preventive or protective medicine, and also the necessary clinics for corrective or curative medicine, in so far as patients require neither institutional treatment nor specialist treatment. When they need these, the consultation centre should be the distributing authority, passing them on to the appropriate quarter, watching their treatment, and receiving them back when convalescent.

This would seem to suggest that consultation centres should be glorified out-patient departments, and in a sense they are, so far as the corrective side of medicine is concerned. They represent an attempt to transfer back to the medical practitioner that large mass of work which he complains has been lost to him during the last few decades. By returning to him, however, what is truly enough "general practice short of specialization" (practically all patients with disorders requiring less than eight days' treatment in bed) the consultation centre will sieve out in the neighbourhood of their own homes great numbers of the people who now waste in the aggregate millions of work-hours annually in the waiting rooms of general hospitals. It will establish for the central hospitals more and more their present-day character as centres for the practice of expert techniques.

In any area of 30,000 people there should be at a minimum one doctor to every 2,000 of the population. Obviously, therefore, the usual staff of a consultation centre will be 15 medical practitioners, together with a superintendent or administrative officer in charge, directly responsible to the Government and acting as its liaison officer. When possible, this officer might be one having at least ten years' experience as a medical practitioner.

These 16 medical practitioners should work on a roster of set hours and fixed days, equitably arrived at among themselves by mutual consent in terms of the local necessities, but subject to central approval, and ensuring that the centre is constantly staffed.

A similar roster should determine domiciliary visiting from the consultation centre in the case of persons who are unable to attend there for treatment.

Usually four of the 16 men would be seniors; juniors would be added from time to time to take the place of those aspiring to higher status in the consultative squad, appointed to hospital staffs, gaining senior positions in other localities, passing to private practice, retiring, or dying prior to retirement.

There are in Queensland about 10 provincial cities and other localities which would require fully developed consultation centres of this type, and 11 more of them would be required in Brisbane itself.

It should be the practice for patients to be admitted to the central or auxiliary hospitals only by card from the consultation centre, except of course in the case of casualties. When patients are sent from the consultation

centre to the hospital their duplicate records should at the same time go forward, and the patient, upon reaching a stage of convalescence sufficient to permit his transfer back to his own home or to out-patient care, should return with his records to the doctor who sent him forward in the first instance for specialist attention. This doctor, who can be the doctor of his own choice more easily in the consultation centre than he can in the suburb concerned (for probably the whole of the practitioners resident in the suburb will be attached there), should be encouraged to maintain his personal association with his patient in hospital and, as opportunity offers, to assist or observe any surgical or other specialist treatment provided.

The central specialist hospital or auxiliary hospital should detain the patient only so long as was necessary for its special purpose, and should then return him to convalescent or out-patient attendance at the consultation centre, or should transfer him to an appropriate preventorium, sanatorium, mental hospital, home for incurables or whatever institution was indicated.

The Consultative Squad.

The connecting link between the hospitals and the consultation centres has already been indicated; it is the consultative squad. Such squads will consist of groups of recognized specialists who have graduated from hospitals or from general practice and who shall include amongst them all those facilities that are necessary to provide a complete clinical armamentarium. They will be associated with the consultation centres at fixed times, will be available at the auxiliary base hospitals, and will in general be attached in a part-time capacity to the central specialty hospital to augment the activities of its resident staff.

Other Features of the Consultative Centre.

Apart from the 16 medical men at the consultation centre and those included in the consultative squad, each centre must have a certain fixed clerical staff with a record system, and adequate telephone and other liaison with the central and other hospitals. An ambulance transport brigade and facilities for mobile practice should also be provided.

Reference was previously made to ancillary services. These, in so far as is possible, should be attached to the consultation centres as aspects of protective services, merging to the extent required with the corrective services. This is particularly the case with dental and optical services, school health services, district nursing, social service work *et cetera*. It is unnecessary to add that the records provided by so inclusive a service would be of the utmost importance for research.

The staff conferences that were referred to previously at hospitals should be even more a feature of the work of consultation centres. It is in no small measure to such conferences that one must look for efficiency in these clinics, and for the continual demonstration of extra ability in one or other of the medical men attached to them.

Comment.

It will be observed from the proposals set out in THE MEDICAL JOURNAL OF AUSTRALIA of December 20, 1941, that, while every medical man is eligible for service in the scheme, such association with the scheme is not compulsory, and the proposals are not inconsistent with private practice. In my opinion the probability is that 70% to 80% of medical practitioners would immediately associate themselves with the scheme, seeing in it not only a better opportunity for service, but economic security.

The Training of Nurses and Medical Students.

Before concluding this commentary I think I should refer to the question of the training of nurses and medical students, since it was suggested that that would be handicapped by a scheme such as that proposed. At present this training is governed to a great degree by the fact that it is bound to set aspects of hospital practice in special teaching hospitals. It has often been pointed out that the student learns in city hospitals the grossly abnormal, but fails to become familiar with the common coughs, catarrhs and minor ailments which form a considerable part of general practice. It is, of course, easier for a student, passing from the study of normal structure and normal function, to apprehend and diagnose the obviously abnormal—that is to say, those wide disparities from the normal which are seen in casualty wards and in cases of grossly established diseases. It is therefore right that he should proceed from his preclinical years at the university to the central specialist hospital for his early clinical training. But in the last two of his three years' clinical course, he should improve upon the present provision by being associated to an increasing extent with the work of the consultation centre. It is there that he will study the more difficult intermediate stages which are the clinical criteria of commencing disease, and which include both the more difficult problems of diagnosis and the more hopeful prospects of correction before serious damage is produced. Medical students and also nurses should be attached for externe work to the consultation centre during their final and penultimate years of training, and this work should involve not only dispensary practice at the centre itself, but such externe work or domiciliary visiting (in association with and under the supervision of the medical man on the consultation centre's roster for that purpose) as may be available.

It is quite obvious that this combined interne and externe system has advantages already recognized in midwifery practice—in Dublin, for example—and this has led to its adoption in several well-known training schools. There are similar advantages to be gained for other branches of medical practice from its inclusion.

The proposal would be, in effect, a revival of the apprentice system which operated so effectively before the "school" monopoly was established by the universities, and which was so regretted when a generation or two ago it gave place to present-day methods.

Conclusion.

Finally, may I refer to certain phrases which have been adopted as catchwords by a surprisingly large part of the profession, but which, I feel sure, have no longer (if they ever had) any real basis. It is, for example, stated that service in a government department "destroys the live interest of the medical man in medical work". This is entirely untrue. Both in government service and in private practice there are medical men whose standards of conscience are low, and these will remain low no matter what their employment. Many private practitioners speak of government medical officers as being unable to appreciate medical problems because of their lack of experience of general practice; the government medical officer might equally retort that the general medical practitioner has little experience of any form of medical care other than private practice, which is becoming more and more a limited zone, and the specialist has less.

It has been my good fortune to have had some experience of private practice, of part-time employment, of honorary work as a visiting specialist, and of full-time salaried service as both a medical practitioner and an administrative officer in the Colonial Medical Service, in State services, and in the somewhat specialized field of the Commonwealth Department of Health. At the beginning of my medical career I had, and at present after a long delay I again have, active experience in medical teaching.

In the three fields—of general practice, of salaried Government service, and amongst University people—I am satisfied that there is about the same degree of devotion to duty, the same interest in research, and the same tendency to keep in touch with medical literature, though the emphasis naturally falls upon different aspects of the subject, the "University" man tending to become academic, the "Government" man tending to become administrative, the "private practitioner" tending to become stereotyped in routine procedures. I think all unbiased observers will agree.

The individuality of the progressive man will make itself felt whatever the circumstances. Is it not an insult to medical men to suppose that a salary means sluggishness? Those who use this argument forget that it falsely implies that the only objective of the profession, its driving force and mainstay, is the urge for a rich monetary return.

The second is the claim that "free choice of doctor will be destroyed by this system". What degree of it is there at present? In a one-man country town (and there are hundreds of them in Australia), there is no more "free choice of doctor" than there is in the army or navy. In a country town, there is no greater choice of doctor for 99% of the residents than between the three or four men practising there. In friendly society practice the choice is greatly limited also; while in the cities, generally speaking, a great mass of the population looks no further than its own suburb or the nearest corner for its doctor.

Patients going to the out-patient department of a general hospital have similarly no choice; and the migratory nature of our population (taking people as it does from town to town and State to State) has to a great degree diminished any popular attachment to a family physician.

It was pointed out by a commentator recently that these words "free choice of doctor" have largely lost their meaning, and that, as a matter of fact, they are no more sacrosanct than the *fiat* that a medical man may not "squat" in another's area, but must purchase the goodwill of it. What is this goodwill? Is it not the salability of the personal loyalty of one's patients? Has any man who speaks about the "free choice of doctor" the right to demand the patients should be bought and sold?

The third point about which much clamour is raised is the catchword "bureaucracy". It is to meet this bogy that I have stressed the essential nature of group practice. When all the men in a suburb are jointly charged with the care of the health of all the 30,000 people in that suburb, how can they be accused of a stereotyped and bureaucratic formalism? The "free choice of doctor" exists to a greater degree than it does at present, for every one of them is accessible to every patient at his need. The doctor, moreover, unhampered by the barrier that commercialism erects between patient and practitioner, working on an equitable roster, and released from the curse of a "24-hour accessibility" to the public, can confine himself to one responsibility—the care of the health and welfare of the people entrusted to his charge.

Group practice is the absolute antithesis of bureaucracy, and this system is founded upon it.

Finally, there is the warning, whispered with every evidence of urgency, that the medical practitioner must beware that, in every circumstance, he "preserves his freedom". Whenever you seek from a medical man a definition of this overworked word "freedom", he is unable to give you one. The least informed and the least reliable mean by it a "freedom" from any supervision; the best informed and best intentioned appear to regard it as a word of power that sets them as far as possible away from "paralysing officialdom". But—there is never, of course, any such thing except with the consent of those paralysed.

This propaganda was ably met by A. E. Brown, of Colac, Victoria, when, in THE MEDICAL JOURNAL OF AUSTRALIA of March 15, 1941, he wrote:

> What disadvantage to ourselves and to the public would result from the loss of such freedom? At present we are free to act and practise as we think best, with only such relation to the public need as is contained in the economic law in relation to supply and demand. We have the freedom to choose our place of work and residence irrespective of whether our services are required there or not, making our decision only on the grounds of what money we can make there. We have the freedom to let our brains stagnate and be idle if we wish; to do good work or bad without supervision; and to vie with quack medicine vendors in empirical treatment for profit. It is to our credit as a profession that more of us do not take fuller advantage of that freedom. We are free to treat two-thirds of our patients for nothing and to make our living by charging the other third, who can pay us more than they should rightly pay for our services. We are free to waste money and energy and our natural spirit of good fellowship in needless competition with our colleagues. We have the freedom to choose the interesting and profitable lines of work and to leave the all-important subject of preventive medicine to those few who are sufficiently interested in it to undertake it. There is nothing inherently valuable to ourselves, and certainly nothing valuable to the community in our freedom to do all these things.

CONGENITAL ABNORMALITIES OF THE GENITO-URINARY SYSTEM.[1]

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THE DEVELOPMENT AND ORIGIN OF THE GENITO-URINARY SYSTEM.

BEFORE discussing abnormalities, I should first like to give an outline of the basic facts of the normal development of the genito-urinary system.

At the end of the fifth week of development, when the human embryo is five millimetres (one-fifth of an inch) in length, it is possible to identify the beginnings of almost all parts of the body. Externally we see the head, in which we can distinguish the beginnings of the eyes, nose and mouth, and the trunk with its primitive segments and limb buds. Internally we can recognize the brain, the heart, the *Anlage* of the lungs and the primitive gut, and it is at this time too that we can see the uro-genital ridges which form in the intermediate cell mass, projecting into the cœlom, one on either side of the mesentery of the primitive gut.

It is not until the seventh week, when the embryo is about 17 millimetres in length, that the gonads have become differentiated sufficiently to enable them to be distinguished either as testis or as ovary.

Vertebrates have made three distinct experiments in the production of kidneys. Beginning with the simplest type in the lowest vertebrates, two improved organs have appeared successively in higher forms. As might have been anticipated, the embryos of the higher vertebrates indicate this progress by repeating the same kidney sequence during development; nowhere can be found a better illustration of the principle of recapitulation. The earliest and simplest excretory organ was the pronephros, functional today only in such adult forms as *Amphioxus* and certain lampreys. The pronephros, nevertheless, does serve as a provisional kidney in larval fishes and amphibians, but is replaced by the mesonephros, which remains as the permanent kidney of these animals. The embryos of reptiles, birds and mammals develop first a pronephros and then a mesonephros, whereas the final kidney is a new organ, the metanephros. Whether these glands represent modifications of an originally continuous organ or whether they are three distinct structures is undecided; but, however this may be, the pronephros, mesonephros and metanephros of amniotes develop successively and overlappingly, one caudad of the other, in the time and place order named.

All the kidney types are aggregates of uriniferous tubules which have a common source of origin and exhibit somewhat the same structural plan. They arise from the mesoderm of the intermediate cell mass, or nephrotome; this tissue lies just lateral to the mesodermal segments and connects the latter with the somatic and splanchnic layers of mesoderm which enclose the cœlom. In conjunction with all three tubules there is a mechanism for separating wastes from the blood; the wastes are then collected and conducted to the common excretory duct which discharges them from the body.

CLINICAL ENTITIES.

Congenital Deformities of the Urethra and Bladder.

Numerous anomalies, depending upon an inhibition or excess of the development of the parts, may occur in

[1] A post-graduate lecture delivered at a meeting of the Downs and South-Western Medical Association under the auspices of the Queensland Medical Post-Graduate Committee on November 15, 1941.

connexion with the uro-genital organs. The discovery of anomalies in either the generative system or the lower portion of the urinary tract should make one suspect and look for congenital abnormalities of the kidneys.

It is my task tonight to deal with some of these, the most common, for time will not permit me to do more. Abnormalities of the testis and its descent will not be considered for this reason. Moreover, extensive and detailed discussion of any of the conditions will not be possible. Nevertheless I hope that my remarks will be of some practical value.

It will be more convenient for me to commence distally in the urinary tract and proceed proximally, so that I shall deal first with the abnormalities about the *glans penis* and external meatus.

Pin-Hole Meatus.

Perhaps the commonest abnormality of the urethra is congenitally small meatus or pin-hole meatus. This may take the form of a round hole with rounded edges or merely of two thin membranous lips fused at the frenal edge of the meatus. Its importance lies in the fact that it constitutes an obstruction to the urinary stream, which may bring about infection in the lower portion of the urinary tract and even cause dilatation of the urinary passages, the ureters and kidney pelvis not excepted, as any other obstruction to the urethra may do. Further than this, if infection gains access to the anterior part of the urethra, and I refer particularly to Neisserian infection, then the narrow meatus is a potent factor in keeping it up by interfering with free drainage. In both cases the condition should be treated by meatotomy. The procedure is as follows. A little 1% "Novocain" solution is injected under the frenulum and the meatus is incised backwards towards this structure. It is advisable to insert two small stitches, one on either side, in an attempt to approximate mucosa to epidermis again, though this is not always successful. If it fails, care must be taken to prevent reformation of the narrowing by the daily passage of a straight anterior sound for four or five days and then once or twice a week as long as is necessary.

Paraurethral Ducts.

Paraurethral ducts are small anomalous ducts of the urethra, which are found on the surface of the glans or in the meatus. As a rule they are only large enough to admit a lachrymal duct probe and about five to ten millimetres in length. They terminate blindly or in a small cul-de-sac, and occasionally one may communicate with the urethra, forming a "fistula". They not infrequently occur in cases of hypospadias. They are most frequently single, but may be multiple, and are brought to notice usually by their becoming infected in the course of a gonorrhœal urethritis. In this case they may be responsible for a persistent infection by harbouring the organism. Their destruction must then be brought about by cauterization of the duct, either with a "silver nitrate probe" or by the actual cautery or diathermy needle.

Such a case came to me from Dr. V. N. B. Willis, who was experiencing difficulty in eliminating the gonococcus. This difficulty led him to search for paraurethral ducts. Cauterization of the duct by a diathermy needle destroyed the little canal and cleared up the infection.

Hypospadias.

Hypospadias may be defined as that malformation of the penis and urethra in which the external urinary meatus is located at some point proximal to its normal situation, but always on the ventral wall of the urethra. It is the most frequent anomaly of the urethra. Various locations of the abnormal opening have been described, from the glans immediately behind the normal situation to a site in the perineum.

Four common sites may be described: the glandular, penile, peno-scrotal and perineal. In the case of the first group the anomaly is due to failure of the development of the phallic portion of the urethra and its union with the penile section of the urethra. With regard to the other varieties, it has been stated by Felix that hypospadias on the shaft of the penis or in the scrotal region is not an inhibition but an hermaphroditic phenomenon—that is, "a further development of the urogenital sinus in the female sense".

In the female a complete arrest in the formation of the penile section of the urethra is normal. In subjects with imperfect differentiation of the sex glands (usually imperfect males) the process is also arrested in an indifferent stage.

The Glandular Variety.—In the glandular variety, at the terminal stage of development, there are three common types of abnormality. (i) The phallic groove in the glans is unclosed and the urethra opens at the primitive meatus. The folds bounding the meatus represent the anterior ends of the vestibular folds. (ii) The primitive meatus is unclosed, but the phallic groove is canalized. (iii) The commonest type, however, is that in which the primitive meatus is open, but the phallic groove has remained uncanalized or there is a dimple or recess on the tip of the glans indicating the position at which the definite meatus should have been. Associated with the anomaly of position of the meatus there is a typical broadening and flattening of the glans, which is also canted downwards. The frenulum is virtually absent and the prepuce is redundant and overhangs the corona like a hood in a characteristic manner.

The Penile Variety.—In the penile variety of hypospadias the urethral orifice may be situated anywhere between the base of the glans and the peno-scrotal junction and may be either rounded or V-shaped. In either case it is often constricted and causes the patient to urinate in a small misdirected stream. The deformities of the glans are even more pronounced than in the glandular type, and in addition the shaft of the penis is curved ventrally. This becomes more marked on erection and causes congenital chordee.

The Peno-Scrotal Variety.—The peno-scrotal variety differs very little from the penile variety except that the deformities are more pronounced and there is a double fold of skin extending from the ventral surface of the penis to the scrotal raphe. Its bifid nature near the penis gives the appearance of small *labia minora*, of which this fold is the homologue. Other deformities often accompany it, such as undescended testes and severe chordee, while the penis itself is undersized. In an exaggerated form—the scrotal type—the scrotum is cleft like the *labia majora*, causing difficulty in determining the sex.

The Perineal Variety.—In the perineal type the penis is so small that it looks like a hypertrophied clitoris hooded by the vestibular folds and lying between the cleft scrotum. In fact the condition is practically pseudo-hermaphroditism. I have come across one female patient with a hypertrophied clitoris closely resembling this condition and I have at present under my care a lad, aged eighteen years, with a rudimentary penis no bigger than the distal two phalanges of the little finger, but perfectly formed.

The Symptoms of Hypospadias.—The symptoms of hyposadias are not pronounced, particularly in the glandular type; in the other varieties there is inconvenience in the act of urination, but no frequency of micturition or incontinence of urine. The disability in all but the first variety is, of course, sexual. Coitus is difficult or impossible owing to the small size of the penis and the chordee, and even if coitus can be accomplished, the seminal fluid cannot be deposited into the vagina.

The Treatment of Hypospadias.—Since the degree of deformity varies so greatly in the different types of hypospadias, no one method is applicable in all cases. In addition, the correction of other congenital abnormalities must be attended to, such as undescended testes, congenital hernia, bifid scrotum. With regard to the hypospadias, the problem is one of plastic surgery. Since time does not permit of the discussion of the several plastic operations that have been devised and practised with varying degrees of success, and since I am not competent

with my limited experience to deal with them, it will be best for me to confine myself to the following observations. (i) Even in the hands of experienced operators in this field and with the best of nursing care, disappointments are frequent. Consequent upon the breaking down of the wounds several attempts are necessary, and even then not all patients are cured. (ii) Success with any method depends on several factors, the chief among which are: (*a*) operation in stages, (*b*) painstaking attention to detail and respect of tissues, (*c*) proper and diligent after-care, (*d*) judgement in the choice of operation and the age at which it is undertaken. This is important, not only because some measure of cooperation is necessary in the later stages of some operative procedures, but also because of the smallness of the penis and the frailty of the tissues involved. In most cases there are three operative stages, though these may not necessarily be separated in time. The first great principle established by Young is the straightening of the penis so as to overcome the congenital chordee. This constitutes the first stage and is all that should be attempted in infants. It consists of the initial incision in the transverse direction, excision of the fibrous tissue and union in the longitudinal direction—the Mikulicz principle. The second principle is diversion of the urinary stream either by suprapubic or by perineal drainage, and the third principle is the reparative procedure itself. These two principles may be embodied in one operation or separated into a second and third stage according to circumstances and the predilection of the surgeon. The best time is after the age of seven years and before puberty. At this age some measure of cooperation may be counted on and troublesome erections are less frequent than after puberty. General principles are the avoidance of tension on all sutures, the use of non-absorptive suture material such as dermal suture or fine silver wire, and the prescribing of large doses of bromide to combat erections.

Epispadias.

While hypospadias is naturally a condition confined to the male, epispadias may occur in either sex and is characterized by a urethral orifice on the dorsum of the penis or clitoris. It is a rare condition. As with hypospadias there are glandular, penile and complete or subsymphysial varieties. The first two varieties need not detain us, but the complete form is of interest. In the complete or subsymphysial type of epispadias there is a gutter on the entire length of the flattened, small penis.[1] It passes under the *symphysis pubis* and an instrument can be passed under it into the bladder. The external sphincter is virtually absent and the internal sphincter is deficient, so that the child is incontinent of urine, which simply drips away. Epispadias of this degree may be difficult to distinguish from minor degrees of extroversion of the bladder. The criterion of differentiation is that if the *symphysis pubis* is developed and closed the case is one of epispadias; if it is undeveloped and separated, the case is one of extroversion.

Ectopia Vesicæ.

In *ectopia vesicæ* the anterior wall of bladder and roof of urethra and the parts of the belly wall in front of these are absent. The trigone of the bladder, the floor of the urethra, and the posterior wall of the bladder are flush and continuous with the belly wall. The opposite halves of the *symphysis pubis* remain apart.

The cloacal membrane extends onto the body stalk during the fourth week of development. Normally, the part of the cloacal membrane that overlies that part of the allantois which becomes the bladder is obliterated by the growth of mesodermal tissue on each side invading the membrane and thus forming the infraumbilical part of the anterior abdominal wall. If this process of fusion along the mid-line fails, and the thin epithelial membrane ruptures, the condition of *ectopia vesicæ* results.

[1] Since this lecture was delivered, a patient with this anomaly has come under my care (November, 1941). He is a boy, aged nine years.

If there is only a failure of fusion in the lower part of the ingrowing mesodermal tissue, and a rupture of the cloacal membrane occurs nearer the body stalk than normal, the uro-genital sinus opens on the dorsal surface of the genital tubercle and epispadias results.

Another explanation is that there is a cephalad displacement of the cloacal membrane and that the genital tubercle later arises below this, so that when the cloacal membrane ruptures the uro-genital sinus opens on the dorsum of the phallus instead of below it (Keibel).

I have to show you a post-mortem specimen of *ectopia vesicæ*.[1]

Diverticula.

Diverticula may be congenital or acquired. In general the following statements hold good: (i) The walls of a congenital diverticulum are usually formed of all the coats of the parent viscus, including therefore a well-developed muscular coat, whereas an acquired diverticulum does not, as a rule, have a complete muscular coat. Consequently the former is able to empty itself of its contents, while the latter is less able to do so; it is therefore likely, too, that its contents will become stagnant and infected. (ii) The mouth of a congenital diverticulum is usually wide, even as wide as the sac itself, so that again it is able to empty itself easily. In acquired or pathological diverticulum just the reverse is often the case, and it often becomes obstructed.

From these facts it is evident that, in general, congenital diverticula are not very liable to accident, may never give rise to symptoms and may thus pass undiscovered. Acquired diverticula, on the other hand, are much more apt to become diseased and to give rise to trouble, such as obstruction, infection, and distension or perforation, or the last two in combination. In the bladder such diverticula may be the site of stone or malignant growth formation.

Diverticula of the Bladder.—The bladder musculature is arranged in three layers, of which the inner is the least complete. The fasciculi of these layers interlace and criss-cross; thus small depressions can be seen with the cystoscope in the partially filled bladder. If there is obstruction to the outflow of urine, these depressions become much more defined and "saucered" out, owing to the protrusion of the mucosa between the muscle fasciculi, which now become trabeculæ; the little saucers are then known as saccules. As the obstruction increases the trabeculæ become more pronounced, since the bladder wall hypertrophies and the saccules become deeper and ultimately form diverticula with the characteristics already referred to. This is the history of acquired diverticula and the reason for their multiplicity. Congenital diverticula do not require obstruction to urination as a prerequisite to their formation. You will recall that the bladder, with the exception of the trigonal area, is formed from the upper part of the cloaca, while the base is formed from the opening out of the fused lower ends of the Wolffian ducts. The line of junction of these two embryological divisions is marked in the adult by Mercier's bar or the interureteric bar. It is believed that along this bar and at the apex of the trigone there is a natural weakness of the bladder wall in some males which gradually yields, resulting in the occurrence of a congenital diverticulum. Such diverticula are usually single and occur almost solely in males without evident obstruction.

Diverticula of the Posterior Portion of the Urethra.—Diverticula of the posterior portion of the urethra may be either congenital or acquired. The latter, however, commonly have a different origin from those of the bladder. The commonest acquired type is due to a persistence of the cavity of a prostatic abscess or cyst which has ruptured into the prostatic part of the urethra. A congenital diverticulum is usually due to an enlargement of the normally present *sinus pocularis* or utricle. There is, however, another way in which a diverticulum may arise

[1] Dr. Sutton, during the course of his lecture, showed post-mortem specimens of almost every abnormality described.

in the prostatic or membranous part of the urethra, and that is by the persistence of part of a congenital recto-urethral fistulous tract formed when the rectum is divorced from the urogenital sinus. It will be remembered that in the human embryo the rectal orifice migrates backwards until it opens in the posterior part of the perineal depression (ectodermal cloaca), leaving the whole of the entodermal cloaca of the embryo as a uro-genital passage or urethra. If the backward migration of the rectum is arrested, then the original cloacal anus is retained, opening into the urethra of the male or the vestibule of the female (*vide* case report).

I have here to report a case of congenital fistula between the rectum and the urethra associated with a crossed ureter and a congenital solitary kidney.

The patient was a child, aged three years, born with an imperforate anus, which was opened by operation soon after birth. Later the urethra became blocked by a grape seed and urine escaped in the anal depression. It was then discovered that there was an ano-urethral fistula and an attempt was made to close it surgically. An inguinal colostomy operation was performed by Dr. Ken Fraser and a closure of the fistula was effected, whereupon the colostomy was allowed to close.

Unfortunately the fistulous track broke down again, and the child, now aged three years, fell into my hands. The colostomy was reestablished and another attempt was made to repair the fistula. During this operation the child died under the anæsthetic. The post-mortem specimen shows a solitary kidney situated on the left side. The kidney is a fusion form with two hydronephrotic pelves and two ureters. The lower ureter is dilated and runs to a normal left ureteral orifice in the bladder. The upper ureter is tortuous and dilated, and runs across the mid-line and forms a bulge into the bladder at the site of the right ureteral orifice. There was, however, no sign of a right ureteral orifice.

The specimen, number P.M. 1315/1940, is now housed in the Pathological Museum of the Medical School, University of Queensland, Brisbane.

Diverticula of the Anterior Portion of the Urethra.—Diverticula of the anterior portion of the urethra are not common and may be congenital or acquired. The acquired type result from injuries to the urethra, persistent ruptured abscess or ruptured cyst. Congenital diverticula are believed to result from tubular structures separated from the urethral canal during the closing of the floor of the urethral groove. I have encountered an example of diverticulum of the anterior portion of the urethra in both a male and a female patient. Whether these were congenital or acquired I am not prepared to say.

The patient, a middle-aged female, of the loose moral, rather alcoholic, type, complained that when she passed urine a little seemed to come out beside the urethra. This did not occur every time, however, but occasionally or at intervals. She was examined gynæcologically, and later cystoscopically by one of the senior resident medical officers at the hospital, and no abnormality was found. The disorder would seem to be cured after some days' catheter drainage and then would reappear. She was referred to me with the idea that she might have an aberrant ureter opening into the vestibule. Close questioning and the employment of the indigo-carmine test did not lend support to this hypothesis, and so I decided to examine her by means of the urethroscope. With this instrument I could see the opening into the urethra and was able to pass a ureteral catheter into it. On passing it a little further I saw it appear under the mucosa of the vestibule, and finally it came through a minute hole there. A subsequent urethrographic examination revealed the extent of the diverticulum and indicated the surgical treatment necessary.[1]

The condition in a male patient was very similar to that depicted in Figure 518 in Bailey and Love's "Short Practice of Surgery", third edition; but the lesion was situated more anteriorly along the urethra. There was no stone present. It was treated by excision and repair.

Congenital Deformities Causing Obstruction in the Lower Part of the Urinary Tract.

The following are congenital deformities causing obstruction in the lower portion of the urinary tract: (i) Extreme phimosis—this needs no description here. (ii) Pin-point meatus—this has already been dealt with. (iii) Congenital valves of the urethra. While valvular obstruction has been described at various points along the urethra, by far the commonest is that found in the posterior part of the urethra in the region of the verumontanum. Only this type will be described, with two case reports. (iv) Congenital hypertrophy of the verumontanum. This is a much rarer condition, in which there are no valves to be found, but the verumontanum, while normal in histological structure, is hypertrophied. I have never come across a case of the sort. (v) Congenital "atrophy" of the prostate leading to a valve-like median bar obstruction at the internal meatus. The characteristic syndrome is obstruction pain, dilatation, infection.

Congenital Valvular Obstruction of the Posterior Portion of the Urethra.

The first case of congenital valvular obstruction of the posterior portion of the urethra was described by Langenbeck in 1802, after the patient's death. In 1925 Hinnman and Kutzmann collected 50 cases from the literature; of these 32, or 64%, were not diagnosed until after death, and until 1919 only three of 27 cases reported were discovered *ante mortem*. Thus until twenty years ago the condition was regarded as a post-mortem curiosity giving rise to great bladder hypertrophy and double hydronephrosis. Since then the clinical recognition of the condition has become increasingly more frequent and more certain.

There are three varieties and three ætiological theories. Young, Frontz and Baldwin made the first comprehensive study and recognized and described the three following types, and most urologists conform to their classification. The first is characterized by a ridge-like fold extending downward from the verumontanum, dividing into two membranous leaves directed forwards and upwards, resembling the valves of a vein. Sometimes there is only one cusp. In the second type the ridge runs up from the verumontanum and divides into two valve-like folds, which are attached to the urethra just outside the internal sphincter. The third type is more or less disk-shaped, resembling the iris-diaphragm with a small hole in the centre. It may occur anywhere in the posterior part of the urethra and bears no relationship to the verumontanum.

The ætiology is not definitely known. The first theory is that these valves are a simple modification or enlargement of the folds and ridges which are normally present in the posterior portion of the urethra. Tolmstschew originated this theory in 1870, and many urologists subscribed to it. Bazy, in 1930, propounded a theory that they represented a persistent (cloacal) membrane, and brought them on a common footing with persistent anal membrane or hymen. Against this view it is stated that they are wrongly situated to be derived from this structure. Similarly Lowsley and Watson explain them as anomalous developments from the Wolffian and Müllerian ducts.

None of these theories can be applied satisfactorily to all three types. Lowsley's and Watson's theory might explain the commonest, Type I, Tolmstschew's theory Type II, and Bazy's theory the iris or Type III variety, and so we are left with one tangible fact, that they are congenital. They have been found in a five months' fœtus and in stillborn infants as well as in boys and old men up to the age of eighty-five years.

The commonest age incidence is from one to ten years. Now, since the condition is undoubtedly congenital, why is it found clinically at such varying ages? It is because of two factors—first, the degree of obstruction to urination, and secondly, the time at which infection becomes apparent and troublesome. The symptoms and signs will therefore be as follows: (i) disturbances of micturition, such as frequency, difficulty, dysuria, dribbling, retention of urine; (ii) signs of ill health—loss of appetite and strength and later anæmia and loss of weight at whatever age, with fretfulness, restlessness *et cetera* in infants and children; (iii) evidence of kidney infection, fever and

[1] A lantern slide of the operation was shown at this point. Dr. Sutton's lecture was illustrated by a number of lantern slides.

chills, lumbar pain and tenderness, and persistent pyuria; (iv) later, as the signs of back pressure and "forced ureter" make their appearance, an abdominal tumour due to a distended bladder or an enlarged kidney, or both.

And this goes on, until finally, whatever kidney tissue is not destroyed by pressure atrophy due to hydronephrosis is lost through chronic diffuse nephritis and pyelonephritis with all its attendant signs and symptoms—a dry, furred tongue, anorexia, dyspepsia, nausea and vomiting, loss of visual acuity, and finally uræmia associated with urea retention and high blood pressure—in other words, renal insufficiency. The important points in diagnosis therefore are (i) mental acknowledgement that the condition is not very uncommon and (ii) the history of the illness—(*a*) urinary disturbances commencing at an early age, (*b*) persistent or prolonged pyuria in a boy, (*c*) the presence of a distended bladder in a boy, (*d*) the demonstration by urethral catheter of residual urine or the disappearance of an abdominal tumour upon catheterization. And then, when suspicions have been aroused, the tentative diagnosis should be confirmed by X-ray examination, excretion pyelography, cystoscopy, and most important of all, urethrography. As a final proof, urethroscopy may be carried out when the valves can be seen in the deep urethra. Cystoscopy reveals trabeculation, cellules and diverticula and golf-hole ureters denoting hydroureter.

Differential Diagnosis.—Unfortunately the condition is often misdiagnosed as pyelitis or nephritis, or when palpable kidneys are present as congenital cystic kidneys, until irreparable damage is done. Therefore in cases of persistent pyuria in male infants or boys, or when paradoxical incontinence of urine or a distended bladder is present, the condition should be considered, and if cystoscopy reveals trabeculation, diverticula or dilated ureters without obvious obstruction, the urethra should be examined in an adequate manner. The passage of a sound or catheter is not sufficient, nor is the demonstration of hydroureter and hydronephrosis by excretion urography. There are two conditions in infants which must be excluded—(i) congenital hypertrophy of the verumontanum and (ii) congenital stricture. In older patients, so-called congenital atrophy of the prostate leading to a valvular type of median bar obstruction must be excluded. These conditions are, of course, of more interest to the urologist.

Treatment.—The treatment involves three distinct problems: (i) decompression of the bladder by urethral catheter and subsequent catheter drainage or suprapubic drainage to combat infection and recuperate kidney function; (ii) destruction of the valves; (iii) removal of diverticula in many cases. When the child has recovered his vitality, infection has been subdued and the renal function has reached a stable and satisfactory operative level, the second and third problems may be dealt with, but not before. The valves are most easily and satisfactorily destroyed by coagulation through a suitable cysto-urethroscope. Failing this, they may be destroyed or incised suprapubically or perineally by the turning down of an inverted V-shaped flap in the posterior lobe of the prostate, as in perineal prostatectomy in the adult. Diverticulectomy may be performed either intravesically or extravesically according to size and position. Subsequent treatment is directed to the overcoming of the residual infection and to the general restoration of health.

Reports of Two Cases.—Finally, my excuses for reporting the following cases are: (i) the serious nature and often fatal outcome of the "complaint" and the fact that it is not very uncommon; (ii) the importance of the condition to the general practitioner and pædiatrician, with whom the first responsibility of diagnosis rests, in view of its easy recognition by cysto-urethroscopy and the great benefit of early treatment.

L.A., aged ten years, was admitted to the Hospital for Sick Children on January 30, 1940, with a history of having had enuresis since the age of two years and of dribbling incontinence of urine of four years' duration. He had received conventional treatment over a lengthy period with no improvement. His condition had been suspected and diagnosed by two doctors in the country, both of whom had realized the seriousness of his condition and had advised him to go to Brisbane for confirmation of the diagnosis and appropriate treatment.

On his admission to hospital he was placed in Dr. Patterson's care. He was pale and ill, his bladder was up to the umbilicus, and he had pyuria. A diagnosis of obstruction in the posterior portion of the urethra with resulting urinary stasis was made. Gross impairment of renal function was evident. He was able to void urine at intervals, but the bladder remained large afterwards. His tongue was furred. The urine was pale and the specific gravity was 1,010; the urine contained large quantities of albumin and pus cells. The blood urea level was 57 milligrammes per 100 cubic centimetres. The hæmoglobin value was 50%. A flat X-ray picture revealed no calculi. A cystoscopic examination was performed on February 8 by Dr. Dixon, whose note reads as follows:

> Cystoscope passed with much difficulty—obstruction situated in prostatic urethra. Bladder very dilated. Ureteric orifices not seen. Orifice seen on right side above expected level of ureter. Seemed to be opening of diverticulum—muco-pus in bladder.

The patient's bladder was then filled with sodium iodide solution and a cystogram was made; this was reported to give "indefinite" findings.

Continuous catheter drainage was instituted and carried on for three weeks; he developed severe urethritis with much discomfort, and his temperature rose. At this stage I was called in consultation. An excretion urogram revealed poor excretion of the sodium iodide solution, but just sufficient to show double hydronephrosis. After the institution of intermittent catheterization and the exhibition of "M & B 693", one tablet every four hours for three days, his temperature fell and he looked better. Indigo-carmine injected into a vein appeared through the catheter in thirty-six minutes (normal, ten minutes). A few days later I performed cysto-urethroscopy; I failed to find the ureteral meati, but got the beak of the cystoscope inside a smooth-walled diverticulum the size of a navel orange. The cystitis had decreased. In the prostatic urethra I was able to make out a right-sided valvular formation running up from the verumontanum in the form of a high ridge rather than a membranous valve. This confirmed the suggestive appearances in the urethrogram which I had taken, and the diagnosis was now confirmed. The valve seemed to conform to Type II.

A fortnight later operation was undertaken. On April 18, with the patient under "open" ether anæsthesia, I was able to coagulate the obstructing fold with a diathermy electrode through a children's cysto-urethroscope. Although the orientation and accurate application of the electrode were tedious and time-consuming, I felt satisfied that I had accomplished my purpose. The bladder was then opened suprapubically and a lighted bladder retractor was inserted.

The opening of the diverticulum could be well seen and felt. It would just admit the tip of my finger, and the edge of it felt like that of a deep-set navel. An attempt was made to invert the diverticulum, but this was incomplete owing to adhesions to its base. Accordingly the orifice was circumcised and dissection was proceeded with all round it. The sac occupied the obstetrical position of "right occipito-posterior" and forceps delivery was impossible, as I have said.

Owing to my lack of accurate knowledge as to the relation of the right ureter to the diverticulum, the deeper dissection was carried out with some trepidation; thus, when I was nearing the deeper part of the sac, I decided to cut through the fibrous outer wall of the diverticulum and peel off the mucosa in the bottom of the sac.

The muscular and mucosal layers of the bladder were closed in two layers with a tube into the retrovesical area of operation. The bladder was then closed about the drainage tube and a suprapubic De Pezzer catheter as well.

After the urethral diathermy, which had taken some time, I debated whether simply to perform a suprapubic cystotomy for drainage or to carry out the excision of the diverticulum. The anæsthetist said that I could take the latter course if I would finish in an hour. I took an hour and five minutes. The child was rather exhausted, and the pulse was rapid in rate and of small volume.

The intravenous administration of saline solution into the right long saphenous vein was commenced and continued for three days. The amount drained from the catheter on the day of operation was 22 ounces.

On the day after operation twenty-four hours of anuria set in, and the pulse rate steadily rose to 150 per minute. The temperature was 101·8° F. Glucose was added to the saline infusion and one gramme of "M & B Soluble" was also given through the day. Alkalis were administered by mouth. The following day (the second post-operative day) vomited material was fæculent and the abdomen became

more distended and tense. A rectal tube had been previously inserted and now gastric lavage was carried out through a Ryle tube with sodium bicarbonate solution. Heroin, one-thirty-sixth of a grain, was given as required. By 6 p.m. on that day his condition had improved and vomiting had stopped. Two days later the resident medical officer reported that the child had recovered from the post-operative shock, but had an elevated temperature and turbid urine. "M & B 693", one tablet every four hours, was given.

From then on his condition gradually improved; on one occasion he had some chest signs, and on another pain and tenderness in the right loin. One month after operation the suprapubic tube was removed and a Hamilton Irving cup was substituted. A rubber catheter was passed easily along the urethra. This was inserted every day and the bladder was irrigated. A week later his suprapubic sinus had closed with dramatic rapidity and he appeared to be voiding urine. The amount of residual urine is now four ounces.

The second case report is as follows.

R.E., aged ten years, was admitted to the Hospital for Sick Children on May 27, 1937. He had begun to feel unwell five days previously. He had vomited several times and had had nocturnal frequency of micturition. On the day of his admission to hospital he had passed only small amounts of urine. An abdominal mass, dull on percussion, extending to the umbilicus, and a separate globular mass the size of a tennis ball to the left of this, were present. A catheter was passed and ten ounces of urine were withdrawn; then gradual decompression was carried out at the rate of six ounces every four hours.

Five days later (June 1) suprapubic drainage was carried out. Three weeks after this the blood urea content was 25 milligrammes per 100 cubic centimetres; the blood pressure was 120 millimetres of mercury systolic and 70 diastolic. The urine contained a heavy cloud of albumin and pus cells. The urinary output was 60 ounces per day. Excretion urography revealed double hydronephrosis. Subsequently a cystoscopic examination was carried out. Generalized cystitis was present and the mouths of two diverticula were found above and behind the interureteric bar. From their position and number these were evidently acquired diverticula. The left ureter was catheterized, but the catheter slipped out during transit of the patient to the X-ray department. Urethroscopy was not carried out, as the instrument was out of order. Urethrography, however, revealed what were undoubtedly the pockets of two valves in relation to the verumontanum.

On August 12 the bladder was opened suprapubically; two diverticula were found and two valve-like structures in the deep urethra could be felt with the finger tip. These were destroyed by incision and crushing. The larger of the two diverticula, which were about the size of a hen's egg, was dissected out and a suprapubic De Pezzer catheter was inserted. To keep the deep urethra patent a catheter was also tied in the urethra. Next day the patient was very pale and ill and saline solution was given subcutaneously.

Two days later his condition had improved. On August 24 the urethral catheter was removed, and twelve days later the suprapubic drainage catheter was dispensed with and the urethral one was reinserted. The left kidney had recovered; the right was still functionless.

On September 18 the urethral catheter was discarded, the suprapubic sinus having closed. He did not, however, void urine well, and his bladder had to be catheterized frequently. On November 2 he developed headache with head retraction and stiffness of the neck. Kernig's sign was elicited. Lumbar puncture was performed. The cerebro-spinal fluid was found to contain no organisms on microscopic examination or attempted culture. The child was given "Prontosil", five cubic centimetres intravenously, and by mouth one tablet three times a day; this treatment was continued, together with the administration of two to five cubic centimetres twice a day per vein.

The patient's condition gradually improved and he recovered from the attack. He still had difficulty in passing urine and was treated with atropine sulphate solution (1 in 500) by mouth in increasing doses, and later with eserine sulphate, without benefit. It was then found that he passed urine (four or five ounces) on being given a general anæsthetic for the purpose of passing sounds. The effect of spinal anæsthesia was then tried; it was successful. This observation lends support to the contention of some that the condition is a neuro-muscular incoordination of the internal vesical sphincter and that the valves are only of secondary importance. However, this explanation does not quite fit the physical signs—namely, dilatation of the bladder neck and the valves distal to this.

After this the child regained control of micturition to a pronounced degree, and his micturition was further improved by the hypodermic injection of eserine, one two-hundredth of a grain per day. His average standard clearance on September 16, 1938, was 37% of normal, which is not very good. He went home on December 23, looking much better. In July, 1941, he was readmitted to hospital and died of uræmia.

Congenital Deformities Causing Obstruction in the Upper Part of the Urinary Tract.

Congenital deformities which cause obstruction in the upper part of the urinary tract must now claim our attention. These are congenital stricture and valve formation of the ureter, and cystic dilatation of the lower end of the ureter.

Congenital Stricture or Stenosis of the Ureter.

The most commonly observed condition causing obstruction in the upper part of the urinary tract is one of congenital stenosis of the ureteral meatus on one or both sides. The narrowing involves only the mucosa and converts the usual slit-like opening into a small, rounded orifice. While this condition is often present without any apparent ill effects, it must be remembered that narrowing of the urinary tract, however slight, has great potentialities for harm, since the secretory pressure of the kidney is not great. Especially are its baneful effects likely to become manifest in stone formers and in the case of superadded infection. The characteristic syndrome is: obstruction, pain, dilatation, infection.

Much less common is stricture of the ureter itself, and it is difficult to decide whether the condition is congenital or acquired. The site of the stricture may be anywhere along the ureter—that is, in the intramural part of the ureter, at the uretero-vesical junction, or where the ureter crosses the brim of the pelvis.

The effect of tight congenital stricture may be either atrophy of the kidney or hydronephrosis and hydroureter. When atrophy occurs, the kidney may be reduced to a small fibrous mass, of inconspicuous size, and this has often led to a diagnosis of congenital absence of the kidney.

Congenital stricture at the pelvi-ureteral junction causes congenital hydronephrosis. I have removed such cystic swellings from children on more than one occasion.

Minor degrees of congenital narrowing of the ureter, however, may and often do exist. This is commonest at the uretero-vesical junction and where the ureter crosses the pelvic brim; it causes pain in the affected side, but little else for a variable length of time until infection supervenes. It is a common cause of pain in either iliac fossa, and on the right side it explains some cases of failure of appendicectomy to relieve pain in the right iliac fossa. The treatment of the condition is dilatation of the ureter, and this is generally effective, though it may have to be repeated at intervals.

Congenital Cystic Dilatation of the Lower End of the Ureter.

Congenital cystic dilatation of the lower end of the ureter is a condition to which I want particularly to draw your attention. It is also known as ureterocele—that is, cystic dilatation of the lower end of the ureter. This is not an uncommon condition, but it is little known. It is discovered once in about every one hundred diagnostic cystoscopic examinations.

According to Harry Fenwick, the earliest description of the condition was made by Sir Thomas Smith in 1863, under the title "Prolapse of the Ureters into the Bladder". Fenwick himself fully discussed the condition roughly forty years ago, and numerous European and American authors have recorded cases of this abnormality.

At the first post-graduate course held in Brisbane in the first week of August, 1925, during a cystoscopic demonstration, I was able to show an abnormality of this sort. My notes read as follows:

In place of the normal slit-like opening of the ureter one could see a small rounded and somewhat reddened opening lying at the lower end of a puckered mass of mucous membrane. While I was watching for the efflux of urine from this side the wrinkled mass was seen to rise up in the form of a smooth rounded tumour the size of a sparrow's egg—

smooth and glistening in appearance. At regular intervals the lower end of the ureter was found to be ballooned out in an unmistakable fashion, rendering the small rounded orifice more prominent, and one could see a fine forceful stream of urine ejected from it.

The "balloon" would remain distended during the time of the efflux and then would calmly collapse into the resting stage as first seen.

It called to mind the ballooning of a phimosis of the prepuce on urination. The term prolapse would certainly be inappropriate.

The orifice of a ureterocele is almost always pin-point or at least small and rounded.

Fenwick held that if the urine from the corresponding kidney remained sterile, provided the ureteral wall above the obstruction was not weakened by inflammation, the force of the ureteral peristalsis had first to be exerted on the thin-walled intravesical portion of the ureter above the stenosed meatus. This gradually acquired the form of a globular cyst. Stenosis of the ureteral orifice is, however, commonly found on cystoscopic examination of adults and is not in itself sufficient cause for ureterocele.

This has been pointed out by Sir John Thompson Walker and also by Petillo (*Surgery, Gynecology and Obstetrics*, June, 1925, page 811). Petillo aptly remarks: "Should the hydraulic pressure of the urinary mass increase for some reason (stricture or stenosis of the orifice) to such an extent as to determine dilatation of the pelvi-ureteral tube, the section of the tube which would dilate first and most would be the renal pelvis." Therefore the inference is that that portion which does dilate—namely, the portion just above the narrowed meatus—must be pathologically weak. This weakness is now believed to be due to a congenital failure in development of the fibrous envelope of the lower end of the ureter known as Waldeyer's sheath.

The abnormality may be met with at any age from infancy to old age. It may be unilateral or bilateral. There may be double ureter or some other congenital abnormality associated with it. So long as the urine remains sterile the condition may be symptomless and moderately large ureteroceles are consistent with a normal urinary tract above them.

Often, however, pathological changes do make their appearance as a result of prolonged obstruction with superadded urinary infection. The intravesical cyst enlarges and the ureter and kidney pelvis above become enlarged (infected uretero-hydronephrosis). Urinary stone is not uncommonly added to this. The symptoms are those of urinary distress, dysuria, frequency of micturition or urgency. Pain is usually of the renal type. In infants there is often a history of prolonged screaming and of difficulty of urination. In female children the tumour may even be protruded from the urethra, with attendant tenesmus or retention of urine with incontinence of overflow.

Such a case was reported by Furnival (*The Australasian Medical Gazette*, Volume XXIII, 1904, page 394).

This year I have had a similar case. The patient was a little girl, aged three years, and I was able to diagnose the condition and confirm it by cystoscopy. She had bilateral hydronephrosis, badly infected. She also suffered from recurrent attacks of bladder neck obstruction owing to the ureterocele covering the internal urinary meatus. On two or three occasions the ureterocele prolapsed through the urethra and she came to me on one such occasion.

Persistent pyuria in children, more especially female children, should always arouse a suspicion of the condition and should prompt a cystoscopic examination. Pyuria in children should not be allowed to drag on for months diagnosed as "chronic pyelitis", as it often is. If after one month's medical treatment pyuria still persists, it is time to review the diagnosis in any case, whether the patient is an adult or a child.

The diagnosis is readily made on urological examination. Cystoscopy and urography are especially helpful, and the latter may reveal a filling defect in the case of large ureteroceles if a cystogram is made. The condition must be distinguished from prolapse of the ureteral mucosa, an entirely different pathological entity, and from a dilated ureter holding a stone, which, of course, will usually be revealed in the X-ray picture.

Removal of the obstruction is the main desideratum in treatment. This may be done by diathermy, by cutting with cystoscopic scissors or by open operation. I have used all three methods.

A.M., aged thirty-three years, complained of pain in the left iliac fossa. Excision of a ureterocele had been carried out three years previously through a cystotomy incision. Cystoscopy on May 23 revealed a healthy bladder and no sign of the ureterocele. In its place was a rounded ureteral orifice. There was no obstruction along his left ureter and the pyelogram of the left side revealed a perfectly normal pelvis and calyces. He had had no more pain.

Congenital Abnormalities of the Kidneys and Ureters.

The important part which congenital deformities of the urinary tract play in maintaining urinary infection has only recently received the attention it deserves. It should be more generally recognized that the diagnosis of "chronic pyelitis", as applied to the continual passage of pus-laden urine, is inaccurate, misleading and detrimental. This has already been referred to in the section dealing with congenital valves of the posterior portion of the urethra of the male and with cystic dilatation of the lower end of the ureter mostly in the female.

Deformities of the ureter itself and of the kidney pelvis similarly may cause urinary stasis, which soon leads to infection and continual pyuria. Consequent on this there may arise hydroureter and infected hydronephrosis.

If the deformity is bilateral or is so placed as to cause partial obstruction of both ureters, the result will be bilateral hydronephrosis with progressive renal fibrosis and the various symptoms associated with chronic nephritis and a failing kidney function.

These two clinical pictures—namely, that of chronic pyuria and that of chronic nephritis—are the two clinical syndromes that one should associate in one's mind with congenital deformities of the urinary tract in general and with chronic ill-health in children in particular.

The following are the more important maldevelopments of the kidneys and ureters that I wish to discuss in detail:

1. Anomalies of structure.
   - (*a*) Congenital hypertrophy.
   - (*b*) Hypoplasia and aplasia of the kidney.
   - (*c*) Congenital cystic kidney.
2. Anomalies of form.
   - (*a*) Horseshoe kidney.
   - (*b*) Unilateral fused kidney.
   - (*c*) Other fusion forms.
3. Anomalies of number.
   - (*a*) Congenital absence of one kidney.
   - (*b*) Supernumerary kidneys.
4. Anomalies of position.
   - (*a*) Congenital "ptoses".
   - (*b*) Ectopic kidney.
5. Anomalies of the ureter.
   - (*a*) Ectopic ureter.
   - (*b*) Bifid and double ureter.
   - (*c*) Megalo-ureter.
6. Anomalies of vascularization.
   - (*a*) Aberrant vessels.

Anomalies of Structure.

Congenital Hypertrophy of the Kidney.—Congenital hypertrophy of the kidney is always present when the opposite kidney is either congenitally absent, infantile or aplastic. It is characterized by increase in size and functional capacity. Unlike the kidney of acquired compensatory hypertrophy, there is an enlargement of the renal pelvis as well as of the parenchyma. Such a kidney may cause clinical worry and should always be borne in mind when an enlarged kidney is felt clinically.

Congenital Hypoplasia and Renal Aplasia.—Renal aplasia is a condition in which there is only a remnant of rudimentary renal tissue unconnected with the ureter on the same side. There is therefore no true kidney and no renal pelvis. Consequently the renal artery is small or absent and there is no renal pedicle as such. The ureter is stunted in growth and may not even be patent, but there is usually a small ureteral meatus on the corresponding side of the

trigone. Complete urological examination may lead one to suspect this condition, or the closely allied condition of renal agenesis or congenital absence of one kidney.

Congenital hypoplasia of the kidney is perhaps a more important anomaly, because, apart from the fact that a hypoplastic kidney may not be capable of sustaining life if the other kidney becomes grossly diseased or is removed surgically, it is less obvious, offers greater difficulty in diagnosis and is not uncommon. Essentially the kidney is small and normal, but it is nevertheless an infantile kidney. Such kidneys show fœtal lobulation and may contain solitary or multiple cysts. In common with all congenitally abnormal kidneys, a hypoplastic kidney is prone to infection by pyogenic organisms, to tuberculosis and to calculus formation, hydronephrosis *et cetera*. The failure in development appears not to be confined to the nephrogenic tissue of the genital cord, since maldevelopment of the pelvis and calyces is present as well. This will be stressed when the diagnostic features are discussed. The arrest in development leads to a diminutive kidney, one-sixth to one-third of the normal size, and its characteristic gross appearance is as follows. It usually has a long and narrow pelvis with short, broad minor calyces. A characteristic feature is that the upper major calyx is often unusually elongated and appears in line with the ureter. The pelvis, however, may be bifid or it may be hydronephrotic. As was stated previously, a hypoplastic kidney is more subject to renal disease than a normal kidney; hence it is often found to be the site of pyelonephritis. This is what usually brings the condition to notice. In such an event, apart from the usual symptoms of the infection, renal pain is the predominating symptom. Other than this, there are no characteristic symptoms from which the condition may be even suspected. Therefore, renal pain in the absence of a calculus shadow on the X-ray film of a patient with pyuria should call the condition to mind. One's suspicions would then be strengthened if in addition one found on clinical examination some congenital abnormality of the external or internal generative organ. The final diagnosis, however, depends on a complete urological examination. Excretion pyelography alone may not reveal the true state of affairs, partly on account of the inadequacy of the method for accurate diagnosis, and partly because the function of these kidneys, particularly if they are infected, may be too poor for them to excrete sufficient contrast medium to outline the pelvis and calyces. A retrograde pyelogram is therefore necessary. Perhaps the renal outline on a good plain X-ray film may be discernible and may indicate a small amount of renal parenchyma. Often, however, the diagnosis will not be possible before operation, for even when such a kidney has been removed, on account of pain or a complicating disease, it is a nice problem to decide whether the condition was one of hypoplasia with added pyelonephritis, or of chronic pyelonephritis in a normal-sized kidney with secondary contracture.

From what has been said you will appreciate that the condition is one of great clinical importance, and that while any treatment that may become necessary from infection, calculus or hydronephrosis in such a kidney is essentially the same as that for any other kidney, nephrectomy may be more appropriate on account of the organ's inherent low functional reserve.

The following is a case in point:

Mrs. McD. presented herself at my out-patient clinic in October, 1941, complaining of pain in the right iliac fossa, which radiated towards the right loin. The pain was rather sharp at times, at others more aching in character, and had been present for some weeks. She had had no previous renal disease. The flat X-ray film revealed no shadow suggestive of stone, and her urine contained no pus. Cystoscopy revealed a normal healthy bladder and the right ureter was patent.

The pyelogram showed the right kidney pelvis to be small, with small fœtal minor calyces along its lateral border. The outline of the right kidney was considerably smaller than normal and the kidney was ptosed. On the other hand, the outline of the left kidney was large.

This, then, is an example of a congenital ptotic hypoplastic right kidney with hypertrophy of the left kidney.

TABLE I.
Urea Concentration Test.

Number of Sample.	Volume. (Cubic Centimetres.)	Urea. (Percentage.)	Urea Excreted. (Grammes.)
1	34	0·9	—
2	47	0·8	0·4
3	11	1·2	0·1
4	17	1·2	0·2

Total amount of urea excreted: 0·7 gramme.

Congenital Cystic or Polycystic Kidney.—Congenital cystic or polycystic kidney is truly hereditary and has been found to occur in as many as four generations. It is frequently accompanied by other congenital abnormalities—for example, hypospadias, polydactylism *et cetera*. While there have been many and varied explanations of the cause of the anomaly, two only need be considered here.

(i) The first and commonly accepted one is that the failure of the uriniferous tubules (developed from the renal vesicles or nephric buds) to make a proper union with the collecting tubules (developed from the ureteral bud) gives rise to this condition. It is believed that fluid formed by the glomeruli cannot find its way out into the collecting system and becomes imprisoned in the innumerable cysts thus formed, which are studded throughout the kidney substance. As the cysts increase in size the kidney is compressed, and much fibrous tissue is added to that which has been present at the site of the obstruction since birth.

(ii) The second is put forward by Norris and Herman (*The Journal of Urology*, August, 1941, page 147), and is described as a persistence of normally provisional or temporary (vestigial) elements (nephrons) of the metanephros. From a study of four cases which they described and the descriptions and illustrations of others in the literature, these authors state that it seems likely that up to a certain period in fœtal life development of the kidneys was generally normal. According to such a theory, the branching collecting ducts came in contact with the metanephrogenic substance and differentiation of the capsules of Bowman, of the glomeruli, and in some instances of the uriniferous tubules, was completed. Localized cystic dilatations occurred simultaneously or at a later period in both uriniferous tubules and collecting ducts. Many of these dilatations were present, however, before completion of the normal growth of the kidney. Degeneration of these abnormal nephrons followed, with the result that glomeruli and capsules of Bowman and segments of uriniferous tubules and collecting ducts became isolated. Some of these already containing cystic dilatations increased in size; others may have likewise become dilated and cystic or may have atrophied and disappeared. Since the epithelium was still capable of proliferation during the fœtal period, anastomoses and intercommunications among these segments were numerous. In many instances rupture of septa and walls of tubules also caused anastomoses. As the cysts continued to enlarge, progressive inflammation, atrophy and scarring of the adjacent stroma and relatively normal nephrons occurred. In the first case no normal parenchyma was present (large abdominal masses so hampered the baby's respiration that he died twenty minutes after birth); but in the other three cases enough functioning nephrons remained to support life for varying periods. The authors propose, therefore, that in the case of polycystic kidneys a much greater part of the metanephros is provisional than is normal, and that degeneration of the nephrons following cystic enlargement is an abnormal extension of the process which occurs normally in the case of the mesonephros and probably also in the first units of the metanephros.

Such an explanation appears to be applicable to most of the congenital anomalies associated with polycystic kidneys and to be compatible with the hereditary nature of the disease. The fundamental cause of polycystic disease of the kidneys must be in the germ plasm.

These factors lead to symptoms and signs, the chief of which are renal insufficiency, pain and hæmaturia. Pathologically the condition is bilateral, but clinically it may appear to be unilateral—at all events at first. However, the apparently normal kidney always becomes cystic later; hence such a kidney should never be removed. In practice three types of the lesion may be recognized: (i) the painful type, (ii) the hæmorrhaging type, and (iii) the nephritic or uræmic type. Pain is the most common symptom and is usually present in some degree or at some stage in all three types. It may occur over a number of years or come on at a late stage, particularly if a hæmorrhage occurs into one or more cysts. It may, of course, never be a symptom, and this is sometimes the case in the nephritic or uræmic type. In the first type the pain is usually of a dull, aching character, while in the hæmorrhaging type it may be more severe, with acute exacerbations associated with an increase in size and tenderness of the already enlarged kidney. Hæmaturia of an intermittent character, associated with pain, may last for several days or weeks and may be followed by complete remission. No other symptoms or signs may be present, except probably a palpably enlarged kidney on one or both sides. Albuminuria and signs of renal insufficiency may be the first indication of the disease. Such cases run a course of chronic nephritis followed by uræmia and death.

In all cases the most important physical sign is a palpable tumour. It is characterized by its hard, elongated, irregular form and its nodular surface. There is no suspicion of fluctuation. The finding of two such swellings, one in each renal area, is not pathognomonic, but very suggestive of bilateral polycystic disease of the kidneys.

In children there is evidence to suggest that multiple small cysts in great numbers are a more common finding than the presence of fewer and larger cysts, as in adults. In children the nephritic type seems to predominate. It is to be noted that the liver, the pancreas and even the lungs may be affected by the same condition. I have seen a case in which both kidneys and the liver were involved, but not the pancreas.

In the diagnosis of the condition the most important aid to palpation is the pyelogram. The renal shadow is enlarged in all directions and may have an irregular outline. Similarly the pelvis is elongated towards each pole and the calyces are spread apart. The major and minor calyces are drawn out or lengthened in a characteristic manner. When large cysts are present, the calyces may be so extended and splayed as to suggest a renal neoplasm. But a characteristic feature is that, although the calyces are encroached upon, their contour and sharpness of outline remain. The minor calyces therefore still retain their crescent-shaped appearance when seen in profile.

The renal pelvis is elongated and narrowed, but never dilated, unless there is an accompanying obstruction of the ureter—a most important and constant finding in this disease. Most significant of all is the fact that both kidneys are involved in the same characteristic way, and that the pyelograms of the two sides are therefore very similar.

The treatment of polycystic kidney is generally a medical question, the guiding principles of which are the same as for chronic nephritis. Moderation in all things is the great desideratum.

In some instances surgical intervention may be justifiable. Nephrectomy should never be performed. The operation of evacuation of the cysts devised by Rovsing may give relief from pain, particularly if there has been hæmorrhage into one or more of them. It may also increase renal efficiency by relieving the pressure on the remaining secreting tissue; more than this it cannot hope to do.

I have performed Rovsing's operation on several occasions for the painful type of disease, with some measure of success.

As an example of the nephritic type I may cite the case of a young man, the son of a well-known paint manufacturer in Brisbane, who, evincing the signs and symptoms of nephritis, was thought to be suffering from lead poisoning. At this stage (1929) his urine contained albumin and a few granular casts. The blood urea content was 20 milligrammes per 100 cubic centimetres. A renal function test gave the following results: the specific gravity of the first specimen was 1,010 and the urea concentration 2%; the specific gravity of the second specimen was 1,012 and the urea concentration 1·95%. That is to say, his range of function was becoming curtailed and the specific gravity of his urine was becoming fixed.

Further investigation, including pyelography, revealed the true nature of the complaint, and subsequently his kidneys became easily palpable. He eventually died of uræmia three to four years ago.

This year I was called in consultation to see a young married woman, aged thirty-two years. She had had pain in the right loin, severe enough to suggest calculus. A plain X-ray film revealed no abnormality. Pyelography, however, suggested a cyst of the kidney. Her urine was macroscopically and microscopically clear and contained no albumin. Her right kidney remained large and very tender.

At operation a polycystic kidney was found with several cysts larger than the others. Two of these contained a quantity of dark-coloured bloody fluid. These and many other cysts were opened. She was relieved of her pain.

Anomalies of Form.

Horseshoe Kidney.—The term horseshoe kidney is applied to those kidneys in which there is fusion either of the upper or of the lower poles of the two kidneys across the mid-line of the body. The degree of fusion varies greatly and may consist merely of connective tissue or may involve varying proportions of renal parenchyma in the isthmus. In some cases the isthmus is large, and with the two kidneys it forms an almost uniform semicircular mass. In other cases this is not so. The isthmus usually crosses in front of both the aorta and the *vena cava*; but it may pass between them or even behind both. It usually receives its blood supply from the aorta direct by a special vessel. The position of the horseshoe kidney usually is lower than that of normal kidneys. The ureters, usually two in number, may enter the hilum either medially or on the anterior aspect of each renal mass. In either case they have to pass over the isthmus to reach the bladder. This may give rise to symptoms, though the condition is often symptomless and unsuspected. When symptoms do arise, they take the form of renal pain due to early hydronephrosis, from pressure of the isthmus on the ureters. This may be followed by infection or calculus formation or both. Exceptionally the isthmus causes pressure on the *vena cava inferior*, producing œdema of the legs.

While a plain X-ray film may reveal the abnormal outline of the kidneys, pyelography is the most important diagnostic procedure. One's suspicions should be aroused when the renal pelvis is found to occupy an unusual position, particularly if it is low or near the mid-line mesial to the ureters. The typical pyelogram is that in which the calyces are directed towards the vertebral column instead of away from it. When the renal pelvis is in a normally placed hilum a clue to the condition may be given by the direction of the lower calyx, which, instead of being directed downwards and laterally, is directed downwards and medially. Operation is not taboo in horseshoe kidney. Calculi may be removed by pyelotomy. A ureter which is being pressed on by the isthmus may be freed by division of the isthmus, and this is the more easily accomplished the less renal tissue it contains. Lastly, heminephrectomy has been performed many times in cases of horseshoe kidney associated with gross hydronephrosis, pyonephrosis or neoplasm in one half.

Unilateral Fused Kidney.—In unilateral fused kidney the renal rudiments have become fused in their ascent from the true pelvis as in the case of horseshoe kidney, but instead the combined mass has passed to one side. The kidney proper of that side is situated above the intruder, so that the ureter of the displaced kidney crosses to its own side of the bladder to open in its normal position (*vide* the case report above). The practical importance of the condition is the same as that of hypoplastic or aplastic kidney or as that of absence of one kidney—namely, that if the solitary kidney becomes

diseased the patient has no reserve of renal tissue. It demonstrates the fundamental importance of determining the functional activity of both kindeys separately before operating on one of them.

Other Fusion Forms.—The other fusion forms are so uncommon that I need not go into them here. They are as follows: (i) disk kidney (also called scutiform or shield-shaped kidney), in which fusion takes place along the whole of the medial border before rotation occurs; the result is a flattened, rounded mass lying in the concavity of the sacrum; (ii) sigmoid kidney, in which there is an end-to-end anastomosis of the two kidneys presenting a mass with a sigmoid or S-bend shape; (iii) fusion of one kidney lying in front of the other.

Anomalies of Number.

Congenital Absence of One Kidney.—Congenital absence of one kidney may be described in the opposite way as congenital solitary kidney, which, it is to be noted, is an hypertrophied organ. There is a complete absence on one side of any renal tissue—that is to say, agenesis. Though exceedingly important, it is fortunately rare. The kidney present may be a perfectly normal large kidney or it may be a double kidney with double ureters. In the latter case the ureters may be partially or completely double. When the duplication of the ureters is complete, they may both open into the bladder on one side or one may cross to the side of the renal agenesis. Accordingly the trigone of the bladder may be normal or distorted. Thus there may be one or two ureteral meati on one side and none on the opposite side (*vide* case report of ano-urethral fistula).

When the trigone is normal—that is, when there are two ureteral meati, normally placed, the one on the anomalous side may be short and may end only in a nodule of fibrous tissue.

The diagnosis is therefore possible only by thorough urological investigation involving cystoscopy, chromoscopy and pyelography. The surgical significance of the condition has already been referred to.

Supernumerary Kidneys.—Supernumerary kidneys are rare and of little practical importance.

Anomalies of Position.

In addition to minor variations in position of the kidney—congenital ptosis—which are common, kidneys occasionally show very marked departure from the normal position and are then known as ectopic kidneys.

The importance of so-called congenital ptosis lies in the fact that it is apt to be confused with acquired ptosis, and an attempt may be made to perform nephropexy. The acquired condition constitutes those cases of nephroptosis in which the descent is due to increased weight from hydronephrosis or tumour or to lack of the normal supports of a healthy kidney. Such cases are characterized by ureters of normal length, which by their kinks show evidence of descent, while the calyces appear normal or only slightly blunted.

The congenital ptotic kidney, on the other hand, has never risen to the normal level; its ureter is short and usually straighter than normal, while the calyces show evidence of arrested development.

Ectopic Kidney.—The term ectopic kidney is here reserved for kidneys which have not even reached the loin and may be described as pelvic or iliac, according to whether they are found situated in the pelvis or lying in the iliac fossa. (i) A pelvic kidney usually occupies the hollow of the sacrum and obtains its blood supply from the iliac vessels. Since it may often be felt *per rectum* or *per vaginam*, it may cause confusion in diagnosis with other pelvic tumours—for example, post-anal gut cyst, hydatid cyst, Müllerian duct tumour *et cetera*. (ii) Iliac kidney is of importance for the same reason. On three occasions when I have been present while a patient has been operated upon for appendicitis on account of pain in the right iliac fossa, in each case a flattened mass was found to be an iliac ectopic kidney.

Anomalies of the Ureter.

Ectopic Ureter.—Anomalies of implantation of the ureter are occasionally met with in which the ureteral orifice is found in some organ outside the bladder—namely, the ejaculatory ducts, seminal vesicle or prostatic urethra in the male, and the uterus, vagina or vestibule in the female. In 1937 McKirdie and Polkey (*The Journal of Urology*, Volume XXXVII, Number 5) gave a table of the incidence of these anomalous ureteral openings, as follows:

Table (Modified from Thom).

Male 72.	Cases.
Prostatic urethra	33
Seminal vesicle	20
Vas deferens	6
Ejaculatory duct	5
Unspecified	8
Female 117.	
Urethra	37
Vagina	32
Uterus	3
Vestibule	45

Ectopic ureter is to be suspected usually from incontinence of urine or from other symptoms suggesting an abnormal exit of urine not otherwise accounted for. In many cases there are no symptoms and the diagnosis is made accidentally. In order to establish a diagnosis, most careful cystoscopic and endoscopic examinations are required. Probings, pyelograms and urethrograms may all be of service to this end as well as the administration of methylene blue and so forth. Excretion urography is most useful.

Treatment may take six forms. (i) An electric cutting knife may be introduced into the aberrant ureter after it has been dilated and a cut made into the bladder under vision through a cystoscope in the bladder. (ii) The aberrant ureter may be ligated. (iii) Nephrectomy may be performed. (iv) Heminephrectomy of the portion of the double kidney drained by the aberrant ureter may be performed. (v) Anastomosis of the kidney pelvis or ureters with ligation of the aberrant ureter below the anastomosis may be employed (McClelland, *The British Journal of Urology*, Volume IV, Number 1, 1932, page 46). (vi) The aberrant ureter may be implanted into the rectum. There are many factors to be considered in the choosing of the most suitable method; but heminephrectomy is generally considered the most satisfactory. I have come across two examples of this condition, both in women; neither of them came to operation at my hands.

Bifid and Double Ureters.—The ætiology of bifid and double ureters has been sufficiently explained during the discussion of the origin of the ureteral bud from the Wolffian duct. There are three common types. (i) The most common abnormality is the bifurcation of a ureter near its upper end. In this case there are two separate renal pelves, but there is only one ureteral opening into the bladder on the affected side. Pyelography is the only means of diagnosis. If the pyelogram reveals a small, incomplete pelvis in either the upper or the lower half of an elongated kidney shadow, the presence of a second ureter and pelvis should be suspected. This will happen when the ureteral catheter, reaching the fork of the ureter, passes up to either the superior or the inferior pelvis. It is true that the opaque fluid after filling one pelvis may run down to the bifurcation and up into the other pelvis, thus filling both; but this is the exception rather than the rule. Consequently, in view of the frequency of double ureter, it is most important to draw the ureteral catheter down towards the bladder when making a pyelogram. In fact, this should be the rule, and it should not be necessary to request the radiographer to make a pyelo-ureterogram.

The possessors of such kidneys often complain of renal pain—a lumbar ache—and they are subject to renal infection, calculous hydronephrosis and so forth. In the aggregate their renal tissue must be considered hypoplastic and prone to the abnormal motility syndrome; hence the pain and infection *et cetera*. (ii) The ureter may be double in its entire length except just at the entrance into the

bladder. There is only one ureteral meatus on that side of the bladder, but it is more difficult to fill both ureters at pyelography. Thus a thorough knowledge and close scrutiny of the pyelogram are necessary to make a diagnosis. Clinically the same problems are involved as in the less complete duplication. (iii) The ureter may be double in its entire length, with two separate openings into the bladder on that side.

Congenital Megaloureter.—Congenital megaloureter is not an uncommon condition in infancy and may be found occasionally in later life. The ureter on one or both sides is found to be of such enormous proportions that it may be termed sausage-like or even intestine-like. Its lumen is greatly dilated and its muscular walls are hypertrophied. In the uncomplicated condition (that is, before pronounced stasis and infection lead to hydronephrosis) the pelvis and calyces are of normal fœtal type. The state of the ureteral orifice, however, may be one either of dilatation or of narrowing, and this has caused difficulty in the determination of its ætiology. In later cases, after infection has occurred, contraction of fibrous tissue or the formation of folds of mucosa at points of tortuosity or at the uretero-pelvic or ureterovesical junction may lead to definite mechanical obstruction and secondary hydronephrosis, and may make differentiation between the congenital and the acquired condition impossible. True congenital megaloureter may therefore not be quite so uncommon as some urologists infer. Three theories are current as to its ætiology. (i) The first theory is that the fœtal type of ureter persists into infancy, and owing to a congenital defect of muscular development or of innervation, subsequently acquires the dimensions and characteristics described; I submit that, owing to the increased work thrown on it after birth as a result of growth of the secretory (cortical) part of the kidney, megaloureter results. Such increased work might then produce tortuosity due to hypertrophy of the longitudinal muscle coats of the ureter wall and dilatation due to hypertrophy of the circular muscle coat, in that order; this often occurs in the acquired condition secondary to obstruction. (ii) The second theory is that the condition is due to an achalasia of the uretero-pelvic "sphincter" situated in the intramural portion of the ureter. This is the familiar theory of Hurst to explain cardiospasm and Hirschsprung's disease applied to the ureter. (iii) The third explanation is offered by Vincent Vermooten, of Johannesburg, South Africa ("A New Etiology for Certain Types of the Dilated Ureters in Children", *The Journal of Urology*, Volume XLI, Number 4, 1939, page 455). He calls attention to Chwalla's embryological discovery that at about the second month of embryonic life, at the time when the ureter separates from the Wolffian duct and opens separately into the bladder, its vesical end becomes occluded by an epithelial membrane, which persists for a variable length of time, usually to the end of the second month, but occasionally longer. Vermooten also calls attention to A. Brown's observations on mice embryos (*The American Journal of Anatomy*, Volume XLVII, 1931, page 117) concerning the secretion of the metanephros and a similar obstruction at the uretero-vesical junction. These observations on mice apparently confirm those of Chwalla on human embryos. As a result of his study, including that of many X-ray films, Vermooten suggests that it is the pressure of the metanephric secretion causing an ischæmia of the delicate membrane that is responsible for its sloughing, permitting the secretion to enter the bladder, and that the presence of congenital valves, ureteroceles and strictures at the uretero-pelvic junction are readily explained by the fact that in certain instances the epithelial membrane may persist for an unduly long time. He suggests further that the facts cited are of the greatest significance in the interpretation of the ætiology of ureteral dilatation in infants and children.

Treatment may be (*a*) by plastic operation on the ureteral meatus so as to enlarge it in those cases in which it is undilated or obstructed, or (*b*) by presacral neurectomy. Since the lower end of the ureter is abundantly supplied by branches from the hypogastric plexus, and since stimulation of the sympathetic nerves produces closure of the intramural ureter, this is a rational procedure in cases dealt with early. In fact, the successes reported by Ogier Ward and others following this operation seem to confirm the hypothesis that the condition is essentially due to an incoordination of the neuro-muscular mechanism of the ureter analogous to Hirschsprung's disease.

Anomalies of Vascularization.

Aberrant blood vessels are not uncommon and present many variations. Because of the inconsistency of the veins, clinical interest and importance attach more to the arteries.

Anomalous arteries are, of course, the rule in congenital deformities of the kidneys, particularly in fusion forms and in ectopic kidneys. It is not, however, with these anomalous vessels that we are here concerned, but rather with arteries running to the tolerably normally placed kidney separately from its pedicle.

As has been seen, vascularization of the kidney begins before its upward migration from the pelvic cavity. Hence it is not surprising to find anomalous vessels arising from the iliac, middle sacral or inferior mesenteric arteries. Such an accessory artery may pierce the capsule at any point on the surface of the kidney.

The clinical importance of anomalous vessels arises in two ways. Firstly, when operating on the kidney, the surgeon should always be on the watch for them, since their division unobserved may lead to troublesome bleeding at the time or even to dangerous reactionary hæmorrhage. Therefore, care should be taken in the freeing of the kidney from its fascial envelope; any definite band of fascia may contain such a vessel and therefore should be divided between forceps and ligated. Secondly, since aberrant vessels may enter the kidney at any point, and particularly since they may do so at or about the lower pole, they may interfere with the course and action of the ureter so as to kink or obstruct it and thus bring about hydronephrosis. Whether this is the explanation or whether the hydronephrosis is the primary condition, which by its weight and size is forced over the aberrant vessel, is still a moot point.

Whichever is the correct sequence, the fact remains that division of the vessel is the correct procedure, whether hydronephrosis is present or not, unless the vessel is so large as to cause a detrimentally large infarct in the kidney if divided. In such a case, if hydronephrosis is already present, the propriety of reimplantation of the ureter into the pelvis in front of the aberrant vessel must be considered.

An aberrant vessel is not easy to diagnose before operation; but important information can be gained from the pyelogram, and if this reveals a pronounced kink of the ureter, and if this is near the lower pole of the kidney, the presence of an aberrant vessel must be suspected.

If the patient complains of renal pain worse in the upright position, such a finding should lead to exploration of the kidney.

ACKNOWLEDGEMENTS.

I should like here to express my appreciation and thanks to Dr. Konrad Hirschfeld, curator of the pathological museum at the medical school, University of Queensland, for his courtesy in placing at my disposal the specimens I have shown you. There has been one to exemplify almost every abnormality dealt with. As curator of the museum Dr. Hirschfeld has done and is still doing a great job of work classifying, describing, preparing and mounting specimens. He has already mounted some 400 in this new museum and has glass jars for about 900 more, despite the war. Without his permission and the cooperation of Miss L. Marks, his assistant, I should not have been able to bring them this long way to show you tonight.

Reports of Cases.

ANTHRAX.

By H. O. LETHBRIDGE,
Narrandera.

THE following case has several points of interest, and its publication may be of use.

Clinical Record.

T. was holding sheep whilst a veterinary officer was inoculating them for anthrax on December 18, 1941. Several sheep had died in the yard. T. had not skinned any or touched the carcasses. He noticed a pimple on the back of his forearm on December 25. On December 29 he was referred to me by Dr. Burrell, of Griffith, who had seen him on the day when anthrax was first suspected. A smear from just under the slough contained numerous anthrax bacilli. (It is possible to fail to demonstrate the bacillus from the surrounding vesicles, but from the slough they stand out in platoons and shriek the diagnosis.) A slough the size of a sixpence, a surrounding area of induration the size of a two-shilling piece and dull red in colour, some œdema, a temperature of 99·8° F., and the long incubation period led to the conclusion that the infection was mild. He was given subcutaneously 60 cubic centimetres of anthrax antiserum, and the administration of "M & B 693" was "pushed" for forty-eight hours. After that period the local lesion had increased in size and looked more angry. Vesicles appeared in the circumferential ring, which had before been characterized by raised red induration, the œdema increased and the temperature rose to 101° F. I did not regard the exacerbation as reactionary, so 60 cubic centimetres of serum were given intravenously and the administration of "M & B 693" was stopped; his improvement from then was progressive. Examination of smears from the vesicles failed to reveal the bacillus.

Comment.

1. A mild infection with anthrax may not stay mild.
2. Vesicles may yield a negative bacteriological finding.
3. The intravenous administration of serum is of value in anthrax.
4. Excision would be expected to make the patient's condition much worse.

A CASE OF TETANUS OF SEROLOGICAL INTEREST.

By MERVYN ROBINSON,
Squadron Leader, Royal Australian Air Force.

Clinical Record.

H.I., an aircrew trainee, aged twenty-seven years, reported at sick parade on September 22, 1940, complaining of pain in the back and of a feeling of stiffness in the legs of three days' duration. He attributed his symptoms to stiffness resulting from a recent game of football. He collapsed while waiting and had a typical tetanic spasm consisting of twitching of the right leg and face and slight opisthotonus. This was his first tetanic convulsion. He was admitted to a base hospital, where he was treated under my care.

On his admission to hospital his temperature was 98·4° F. and his pulse rate was 84 per minute. The respirations numbered 24 per minute. He was unable to move his legs and the arms were stiff, but he was able to move them. Slight trismus was present. The knee jerks were absent, and attempts to elicit this reflex brought on tetanic spasms. It was stated that he had received diphtheria antitoxin in January, 1940, and had had severe serum sickness. One cubic centimetre of tetanus toxoid prophylactic had been given on February 15, 1940, while the patient was with the Australian Military Forces. He could recall no injury or wound, and examination of the extremities revealed no recent scars. (After his recovery careful questioning revealed that he had had a nail in the sole of his boot, which had scratched his foot; this was six weeks prior to the onset of tetanus.)

Lumbar puncture was performed. Six cubic centimetres of clear fluid under slightly increased pressure were withdrawn. Microscopic examination revealed no excess of cells. After his admission to hospital spasms occurred every twenty minutes. Throughout the illness "Sodium Amytal" and "Nembutal" were used for sedation. The initial dose of "Sodium Amytal" was three grains. A total of nine grains was given in the first twenty-four hours. It was decided[1] to use the intravenous and intramuscular routes for the administration of antitoxin. A skin test dose showed him to be sensitive to horse serum, so desensitization was carried out. An initial injection of two minims was given subcutaneously, the dose being doubled every twenty minutes. The whole process took four hours. As a precaution against an anaphylactic reaction, a hypodermic injection of $^1/_{100}$ grain of atropine was given forty-five minutes before antitoxin was injected.[2] Ninety thousand units of tetanus antitoxin were given intravenously, very slowly. After the intravenous injection was completed, 20,000 units were given intramuscularly. No undue reaction followed these injections. The spasms became less frequent, but recurred as the effects of the sedative wore off. A second intravenous injection of 50,000 units was given twelve hours after his admission to hospital. There was a severe reaction, characterized by nausea and vomiting, pallor and a feeble pulse. This was relieved by ten minims of adrenaline.

On the second day the sedative needed was three grains of "Nembutal". Whenever he was not under the influence of sedatives, spasms recurred. Twenty-four hours after his admission to hospital 40,000 units were given intramuscularly. Thereafter he slept at long intervals and no spasms occurred. He was able to swallow and to take light nourishment. On the third day one and a half grains of "Sodium Amytal" and one and a half grains of "Nembutal" were given. There were no spasms, and he complained only of stiffness in the back. On the fifth day a few spasms occurred; 30,000 units were given intramuscularly. That evening a pronounced serum rash was present. Two injections of adrenaline (six minims and two minims) partly relieved this. Four and a half grains of "Nembutal" were needed during this period of twenty-four hours. No further tetanus antitoxin was needed, the total amount given amounting to 230,000 units.

On the sixth day the rash was fading and one and a half grains of "Sodium Amytal" only were needed. But on the eighth day a severe rash was again present. It was urticarial in character, and quickly involved the whole body, the face and tongue becoming œdematous. An intramuscular injection of "Calcium Sandoz" (10 cubic centimetres) was given. The intense irritation and vomiting were controlled by repeated injections of adrenaline. The calcium injections were repeated for two days, when the rash faded, and the subsequent convalescence was uneventful. The patient was out of bed on the eighteenth day, and fit for discharge from hospital on the twenty-first day. I was able to follow up the patient until February, 1941. He resumed and completed his training, and in December I passed him as fit to row in a local regatta crew. He is now serving overseas.

Comment.

Deaths after intrathecal injection of serum, attributable to toxic release phenomena, have been recorded.[3] My previous experiences in treating tetanus at this base hospital agreed with the views expressed in 1930, when cases treated at the Hospital for Sick Children, Brisbane, were reviewed.[1] The method of choice is the administration of large doses of serum by the intravenous route, reinforced by intramuscular injections. Lumbar puncture is employed for diagnosis only.

The danger of an anaphylactic reaction when massive intravenous serum therapy is used is well known. The definite history of serum sickness in this case indicated extra precautions, because even in spite of fractional injections anaphylactic deaths have been recorded.[4] The exhibition of atropine prior to the injection of serum and a very slow rate of injection were the means employed. The incubation period in the case reported is longer than usual following a slight foot wound. This may be attributable in part to the injection of tetanus toxoid prophylactic. At the time, two injections of toxoid given at an interval of six weeks was the routine method; three injections of one cubic centimetre of toxoid are now considered necessary to provide efficient immunity.

The Director of Pathology, War Office,[4] discussing the incidence of tetanus among the wounded from Dunkirk, emphasized that casualties should receive 3,000 units of antitetanic serum, irrespective of prior inoculation. No case was reported of tetanus occurring in a soldier who had had tetanus toxoid, but many received tetanus antitoxin on their arrival in England two or three days after being

wounded. However, every soldier in the British Army had not received toxoid at that date. This case report supports the evidence that several injections of toxoid are necessary for useful immunity. It is considered in the services that an adequate dose (1,500 to 3,000 units) of tetanus antitoxin should be given to every man suffering from a wound in which contamination with tetanus is probable, even though he has had the routine toxoid injections. Though the spasms were frequent and severe in the case reported, the barbiturates employed gave excellent sedation. Their use must be pushed to comparatively large doses to be effective. The combination of long-acting and short-acting barbiturates is recommended.

Summary.

1. A case of tetanus is reported occurring after one injection of tetanus toxoid had been given.

2. Comment is made on the route and dosage of antitoxin and on the use of barbiturates as sedatives.

3. The influence of tetanus toxoid prophylactic is discussed.

Acknowledgement.

The permission of the Director of Medical Services, Royal Australian Air Force, to publish the notes on this case is gratefully acknowledged. References were kindly afforded by the librarian, Royal Australasian College of Surgeons.

References.

(1) "Tetanus", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, June 28, 1930, page 845.

(2) Guilleminet and P. Mazel: *"Accidents anaphylactiques mortels chez un enfant après injection fractionnée de sérum antitétanique"*, *Lyon chirurgical*, Volume XXXVI, July-August, 1939, page 458.

(3) W. E. B. Hall: "Deaths in Tetanus: Phenomenon of Toxin-release", *The Canadian Medical Association Journal*, Volume XXXVIII, May, 1938, page 460.

(4) H. M. Perry: "Prevention of Tetanus", *The British Medical Journal*, Volume II, September 14, 1940, page 364.

Reviews.

PROGRESS IN MEDICINE.

TEN editions in seventeen years is a surprising achievement, and "Beaumont and Dodds" has achieved that remarkable feat.[1] The preface gives a long list of additions, and there seems to be only one chapter omitted—that on basal metabolism—while every section has been revised in minute detail. Such a task would be no ordinary undertaking in normal times, but when one considers that the two authors have worked among the horrors of the Battle of London—their hospitals scattered literally and figuratively, and their ordinary duties interrupted by all kinds of special research and national defence work—our admiration should be greatly increased.

There is scarcely a department in routine medicine which is not touched in some way by the work of this book, while some chapters, for example, that on the sexual hormones, contain as complete a summary of our present knowledge as was possible at the time of writing. Recent advances in electro-encephalography, too, are scattered through a number of journals and papers; here are the essentials in a lucid and informing chapter.

The book opens with a chapter on the sulphanilamide drugs—wonderfully complete in view of the overnight advances in this field—there is even a section on sulphathiazole. However, sulphadiazinine and sulphaguanidine were a little too late for the authors' revision.

The chapter on vitamins, too, is complete, the latest important work on synthetic vitamin *K* being included. A very cautious attitude is generally adopted—for example, in the claims for successful treatment of the myopathies by vitamin *E*. A study of this chapter again brings home the truth of the statement that: "We should buy vitamins at the grocer's—not the chemist's."

The chapter on the kidneys occupies 36 pages and is solid, valuable information, with an attempt no less successful than most to produce a classification with appropriate treatment of each type. Tests of renal efficiency are discussed with insight and method, and the valuable section on the obstetric case is retained. The Van Slyke clearance test is regarded as probably the most accurate, but a justifiable plea is put in for the retention of the old simple water tests.

The longest chapter in the book, longer even than that on the sex hormones, is that on *diabetes mellitus*.

At first sight there is a temptation to state that much of this does not represent a "recent advance" and that much is in fact elementary and to be found in any text-book of medicine. Pages of graduated diets, for instance, seem unnecessary till it is remembered that the book is written for war-time England when rationing modifies all diet schemes. "The diabetic is allowed three meat rations in exchange for his sugar ration, and he is also given a treble fat ration." In any case, the chapter is a simple and yet detailed summary of modern diabetic treatment. Protamine zinc insulin and the changes it requires of course have a section to themselves.

In the section on liver investigation the original Van den Bergh-McNee views are put forward, with no mention of the doubts cast on them by more recent workers.

One blessed sentence occurs in this section: "Investigation of the Duodenal Contents (Lyon)": "This has not proved to be of any practical value"; but page 159 gives "Conclusions" on hepatic efficiency tests, too long to quote, but one of the best examples of those "advances" to which the book is devoted, though the promising hippuric acid test is not included.

There is not very much new in the section on the stomach, but again there is an excellent summary, and the gastroscope receives a very fair appraisement.

Five pages are devoted to Addison's disease, and there is little that could be added—an admirable essay.

The chapters on the circulatory system present certain dilemmas. The presentation is so good, so complete and withal so lucid that it is a pity to omit any of it; but the fact remains that by no stretch can some of it be called recent. On the other hand, there are few special books or articles to equal it, and probably the authors feel that completeness is more important than consistency. A useful addition is the discussion on "Doryl" in paroxysmal tachycardia.

The section on the lungs is complete but conventional—an excellent summary, though many will be surprised at Professor Beaumont's finding (of 1924) that in only 2% to 5% of cases of pulmonary tuberculosis is pneumothorax indicated. Much water has flowed under the bridges since 1924.

There are thirty pages dealing with the sex hormones, and it might have been thought that there would have been a temptation on Professor Dodd's part to over-emphasize his work. On the contrary, most readers will find it all too short. To read the work of a master, stating in clear and simple terms what is known, what is surmised, and what is not known of this very complicated subject is a refreshing change, and the odd paragraphs on hormone assays may very well prove "light extra" reading.

There are chapters on Schick testing and immunization which are sound but hardly new, and the really new section in the "Nervous System" is that on electro-encephalography, another short model article. A subject which was expected and not found was the modern treatment of mental disease by shock therapy—"Cardiazol", insulin or electrically induced. It may be pleaded that it is a very special subject, but then so is electro-encephalography, and the treatment of epilepsy by diphenyl-hydantionate (epanutin-dilantin) is discussed at length.

The only real "advance" in the very sound section on the hæmopoietic system is "Plasma Transfusion". This is discussed in sufficient detail for any capable laboratory worker to carry out the technique and the very real advantages are put forward.

The last chapter is that on "blood and urine analysis", which served to make earlier editions so popular. Additions of note are the methods for estimating vitamin B_1 and vitamin *C*.

To sum up, the book is far more than a mere summary of "advances"; it is almost a small text-book of medical investigation. It is certainly a book no practitioner can be without.

Despite war-time difficulties, paper, binding and illustrations are most praiseworthy. There is, however, something present—or absent—in the cloth binding which has rendered it far more attractive than any previous edition to the domestic cockroach, though the bindings of the house of Churchill always have been a great dietetic treat to this creature.

[1] "Recent Advances in Medicine, Clinical, Laboratory, Therapeutic", by G. E. Beaumont, M.A., D.M., F.R.C.P., D.P.H., and E. C. Dodds, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P., F.I.C., F.R.S.E.; Tenth Edition; 1941. London: J. and A. Churchill Limited. Demy 8vo, pp. 454, with 45 illustrations. Price: 18s. net.

The Medical Journal of Australia

SATURDAY, MARCH 28, 1942.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

AIR RAIDS, DOCTORS AND FIRST AID POSTS.

If to be forewarned is to be forearmed, Australian citizens should really be prepared to meet any attacks that may come to them from the air. Reports from England, and particularly from the "blitz" in London, as well as from many other theatres of war, have made clear to everyone what dangers have to be faced, and the news reels at the cinema houses have not spared the people the grim details of destruction that may be wrought. It is well that it should be so. Any attempt to keep the public in ignorance would be more than foolish. To begin with, it would be impossible to conceal the truth, and if the truth could be kept back the real awakening would on that account be more disastrous. The Australian people, however, are practical realists and not easily driven to panic; they loathe equivocation and in general distrust soft words and honeyed phrases. Few who know the Australian people will deny that the fuller their knowledge of a danger, the greater will be their efficiency when they have to face it. The National Emergency Services authorities, the daily newspapers and the broadcasting services have done excellent work in bringing before the public in detail the facts of "what to do in an air raid", practical demonstrations by members of fire brigades have been particularly valuable, and it is safe to conclude that if anyone is still in ignorance, it is his or her own fault. When people are injured in air raids it is the doctors who have to take charge of them and try to repair the damage. This being so, it is the doctor's province to know all about the avoidance, the prevention, of air raid injuries. The members of the medical profession are therefore concerned with protection against air raid injury, with the behaviour of the public while a raid is in progress and with the recognition of injuries and their treatment when the raid has passed.

In the course of a recent communication on blast and concussion in the present war, John F. Fulton, Sterling Professor of Physiology at the Yale University School of Medicine, has made some interesting remarks on bomb destruction.[1] He points out that, when attacking ships and objectives in England during the last two years, the Germans have used five types of high explosive shells—the 50, the 250 and the 500 kilogram aerial bombs and the 500 and the 1,000 kilogram land mines. The 50 kilogram bomb, he points out, produces destruction within a sharply circumscribed space for a width of 20 to 25 feet in brick dwelling houses. When such a bomb strikes the middle of the street, it penetrates beneath the surface before exploding and then lifts up a heap of dirt over an area 20 to 30 feet in diameter and three to five feet in depth, depending on the character of the surface. "The resulting crater presents a hazard to traffic. Taxicab drivers navigating in the blackout become accustomed to dropping into craters of this sort, but are so skilful that they generally stop their cars when the back wheels are on the edge, quietly back out, and take another street." A bomb of this kind dropping in the street generally interferes with the water, gas, electricity, sewerage and telephone services; the demolition squads, however, "work with incredible speed, and generally within ten or fifteen hours all the services are repaired and the streets repaved". Here Fulton makes a remark over which we may pause: "All this requires a close-knit organization on the part of a dozen agencies and utilities, and I should think that the sooner such an organization is worked out on the eastern seaboard of the United States, the less inconveniences of bombing would be felt when the time comes for the enemy to strike." Since water and sewerage are concerned, health may be added to Fulton's remark, and we have reason to ask whether any "close-knit organization" has yet been planned to deal with such matters in closely populated Australian centres. Fulton goes on to explain that the 250 kilogram bomb creates greater havoc, but that the area of destruction is sharply circumscribed, being limited to 100 to 130 feet of four-story brick construction. If the bomb strikes in the middle of the street, the crater is 75 to 100 feet in width and eight to ten feet in depth. Windows may be broken at considerable distances—up to 200 or 250 yards—from the blast wave. The 500 kilogram (or 1,000 pound) bomb is "incredibly destructive" and may demolish the greater part of a city block; much the same may be said of a land mine which comes down by parachute. In regard to the type of bomb that may be expected in further attacks on Australia, little information is available. Privately received reports from Malaya may, however, be quoted for what they are worth. High explosive bombs used on Penang were about 70 pounds in weight; at Singapore 200 pound bombs were used. The correspondent sending this information reported that three direct hits were received on a four-storied reinforced concrete building in the ground floor of which an official office was housed. No one in the office was hurt. All glass had been removed from doors and windows, and all openings on outside walls were protected with fourteen inch brickwork in cement bunding seven feet high. From his examination of a large number of direct hits, this observer stated that it was clear that 70 pound

[1] *The New England Journal of Medicine*, January 1, 1942.

high explosive bombs dropped from a height of 6,000 to 8,000 feet penetrated a six-inch reinforced concrete slab and slightly damaged the slab below. It was quite clear to him that anyone on the ground floor of even a three-storied building with a concrete floor and reinforced concrete roof was quite safe from a direct hit. Heavier bombs penetrated a six inch slab and badly damaged the slab below. This observer also, like everyone else who has written on the subject, insisted that the presence of glass in windows, doors, inside partitions, and so on, was most dangerous; he also added that wire netting, strips of paper, linen and so forth were useless. Reports in regard to the last-mentioned attachment vary; and it is probably right to conclude that their value depends on the distance of the window or door to which they are fixed from the central blast of the explosion. In this regard it may be noted that a recent arrival from England has stated his firm conviction that when windows are not removed the use of heavy curtains gives the greatest degree of protection.

Any discussion on injuries caused by air raids will vary according to those for whom it is intended. Were this journal circulated among the non-medical public, emphasis would be laid on the need for instruction in first aid to the injured, and chiefly on the methods to be used in the checking of hæmorrhage. Something would also have to be mentioned about warmth and general comfort, the homely cup of tea and the cigarette. The readers of this journal, however, are almost exclusively medical practitioners, who are well acquainted with first aid principles and do not need to have them brought to their notice. At the same time they may be reminded that during this war most valuable work has been done during air raids by persons with little or no medical training. The first aid posts and other organized groups which have been brought into being in this country and staffed by non-medical persons, impelled only by a desire to serve and to help their fellow men, should and surely will receive the sympathetic and helpful interest and support of all members of the medical profession. One or two special subjects therefore alone remain to be mentioned. They have been discussed in full on previous occasions in these pages, but the urgency of the present situation is sufficient for a repeated reference to them. The first of these subjects is blast injuries to the lungs. This was discussed in the issue of November 30, 1940, in the light of important work carried out by S. Zuckerman at the instance of the Research and Experiments Department of the Ministry of Home Security in Great Britain, and published in *The Lancet*. It will be remembered that Zuckerman showed that the lesions in the lung (hæmorrhage chiefly from torn capillaries) were mainly due to the impact of the blast wave on the body wall—the bodies of animals were protected when they were clothed in thick layers of rubber, or when only one side of the body was clothed in rubber, lesions were produced only when the unclothed side was exposed to the blast. Attention was drawn to the practical point that there is a danger that the condition may go unrecognized on account of the indefinite physical signs and the delay that sometimes occurs before symptoms make their appearance. Readers who keep their journals and those who have access to bound copies will do well to study this subject. The remaining two subjects for special study have but recently been discussed in these pages and need only to be mentioned. Air raids and injuries to the eyes were discussed in the issue of February 21, 1942, and the loss of consciousness in head injury in the issue of March 7 last. Medical practitioners owe it to their fellow citizens to become familiar with recent work on air raid injuries, and this statement applies chiefly to those who are in charge of first aid posts. The non-medical members of the staffs of such groups will be keen to do what they can and may possibly be over-zealous. The medical officer in charge must know his subject, he must also be tactful in checking any who are too zealous, lest by an untimely word he dispel zeal. If he lays stress on caution and on the variation of the response shown by the human body to trauma, he may make zeal for action become zeal for knowledge on which correct action can be based.

Current Comment.

OBJECTIVE ASSESSMENT OF DRUGS USED TO RELIEVE CARDIAC PAIN.

QUITE a diversity of opinion still exists as to the efficacy in the clinical sphere of certain alleged coronary dilators. The value of nitroglycerin is undisputed, but contradictory reports about the xanthene and purine preparations, such as theophylline sodium acetate, "Aminophyllin" muscle extracts, are still appearing in current literature. Laboratory experiments upon isolated rings of coronary muscle, upon coronary flow in the mutilated and intact animal, have given strong support to the claims of these drugs, but clinical evaluation has usually depended upon the subjective results in sufferers from *angina pectoris*. Psychological factors, such as the increased sympathy and attention received by such patients while under investigation, and the frequency of equal benefit from inert substances administered as controls, have further confused the interpretation of clinical results. There has been a clear call for investigation of clinical material by some objective method which can give a practical direction to the use and abuse of these useful, if expensive, drugs.

A. S. Freedberg, Joseph E. F. Riseman and E. D. Spiegl, of Boston, have attempted with success to evaluate drugs with a reputation as coronary dilators by means of combining two well-known forms of objective observation, and comparing these with the subjective sensations of the patient.[1] The combined method was to observe the effect upon the *RS-T* interval of the electrocardiogram of exercise measured according to the number of trips made up and down a two-step ladder. This exercise was continued to the point of pain or fatigue, or to the moment when a depression was first observed in the *RS-T* segment of the cardiogram. Care was taken to perform all tests at the same hour of the day, at the same temperature, and with a sufficient interval between tests. No patient knew which drug had been administered, or whether an inert *placebo* had been given. Drugs requiring an interval for absorption after oral administration, such as theobromine sodium acetate and quinidine sulphate, were taken for one week prior to the test, while rapidly absorbed drugs, for example, nitroglycerin, were given two minutes before the tests began.

The amount of exercise necessary to produce pain was constant (within six trips) for each of the fifteen patients investigated. Immediately after the onset of pain caused by exercise, the electrocardiograms of all but one patient showed a depression of the *S-T* segment of one to four millimetres, as compared with the tracing taken at rest. The degree of depression was constant for each patient.

[1] *American Heart Journal*, October, 1941.

The results after the administration of lactose or sodium bicarbonate were identical with those obtained when no medication was given. Thus it is seen that a satisfactory "base-line" for the experiment existed. It was further observed that no correlation could be detected between the degree of depression of the *S-T* segment and the amount of work needed to produce pain.

Nine of thirteen patients investigated before and after receiving one two-hundredth of a grain of nitroglycerin (0·3 milligramme) showed themselves able to do more than 50% more work without pain, and the average depression of the *S-T* segment of the cardiogram, was reduced from 2·1 millimetres to 0·2 millimetre. Two further patients showed a moderate response, and two more were unimproved. Four of thirteen patients who had received two grammes of theobromine sodium acetate daily for a week were able to perform 50% more work before developing pain. The average *S-T* segment depression was reduced from 1·7 millimetres to 0·1 millimetre after medication. The condition of seven patients was improved to a less degree, and two others remained unbenefited by the drug. Another group of twelve patients were given 0·3 gramme four times daily for a week. Of these, four showed a marked response, and three, no response, with corresponding changes in the *S-T* segment level of the cardigram. Apart from its usual effect of prolonging electrical systole, a week's quinidine administration had had no effect upon the *S-T* interval. An attempt was made to digitalize three patients fully, but they would not continue taking the drug to the point of full saturation because of increase in pain and lessened exercise tolerance. Further, the drug failed to lessen the degree of *S-T* depression which existed before medication, when the patient exercised to the point of pain. In fact, after digitalis, the electrocardiographic changes induced by twenty-six trips up the steps were greater than those observed after forty trips when no medication was given.

These results show that the administration of nitroglycerin, theobromine sodium acetate or quinidine sulphate in the dosage and manner customarily employed is of definite therapeutic value, whereas the administration of digitalis is harmful to some patients with *angina pectoris*. The results, moreover, confirm laboratory studies and mature clinical opinion in many lands. They must be permitted more weight than contrary opinion based upon the subjective test of the patient's own feelings of distress, which are subject to much spontaneous and atmospheric variation. It must be borne in mind when considering this question that about 30% to 40% of sufferers from *angina pectoris* do not respond to any drug in use today. The simplicity of the method of clinical assay used in this study, together with the practical applicability of the results, suggests at once an extension of the inquiry to other drugs, such as "Aminophyllin" muscle extracts *et cetera*, which are widely advertised. The authors hold that in the evaluation of any new or reputed remedies for cardiac pain the following should be considered: (*a*) the incidence and degree of beneficial effects; (*b*) adequate control studies; (*c*) careful comparison of these results with the clinical response; (*d*) objective electrocardiographic studies on patients to confirm these results; (*e*) studies of the toxic effect of the drug; (*f*) comparison of the efficacy of the drug with that of other drugs.

The authors in a neighbouring article proceed to assess a newcomer to the series, octyl nitrite. This is a liquid nitrite of one of the higher alcohols, sufficiently volatile to be administered by inhalation from a proprietary inhaler, similar to that used to administer benzedrine vapour. They conclude that the drug is effective in prevention of attacks, and in cutting them short. It is more rapid than nitroglycerin, but accurate dosage is impossible, and overdosage is common if the maker's directions are followed. The symptoms of overdosage are like those of overdosage with amyl nitrite, and the drug is more costly than nitroglycerin, but less so than amyl nitrite. There is still a need for a cheap rapidly acting anodyne for cardiac pain, the dose of which can be accurately measured. Nitroglycerin takes a minute or so to act, and often by this time the pain is already waning. Freedberg and his co-workers have made a real contribution in placing a qualitative problem upon a simple objective basis, and if the six considerations mentioned by them are applied to future remedies, the profession will be spared much futile prescribing and the public much needless expense.

HYPOCHROMIC ANÆMIA.

THE demonstration by Whipple, that liver was the most effective agent in restoring the hæmoglobin level to normal in dogs subjected to repeated bleedings, led to the trial by Minot and Murphy of liver for the treatment of pernicious anæmia. The success which attended this trial and the subsequent adoption of liver therapy for pernicious anæmia are well known; but this has gradually given rise to the use of liver in conditions unrelated to pernicious anæmia. It thus appears that liver extracts are of some value in the prophylactic treatment of the nausea and anorexia often associated with deep X-ray therapy; and it is probable that some improvement in intestinal absorption occurs in the sufferers of such diseases as cœliac disease when liver extracts are exhibited. There is, however, no evidence to suggest that, in man, liver therapy is of value in the treatment of any anæmia which is not due to some interference with the formation, absorption, storage and use of the hæmatopoietic principle.

While most physicians will agree with this statement, and will agree that any treatment in an individual case should be based on more than a pious hope that it will do some good, they continue to prescribe liver extracts in anæmias entirely unrelated to pernicious anæmia. When questions are asked about this, the answer usually given is to quote Whipple and his dogs, and to ignore experiments in man. There is no doubt that secondary hypochromic anæmias respond to liver extracts and adequate doses of iron salts (of which ferrous sulphate produces least gastro-intestinal disturbance and is the most efficient; five grains being an adequate dose for an adult); but there is no doubt that in these cases a similar response would be elicited by the iron salts alone. This point has been stressed, for liver extracts are included among those drugs which are becoming increasingly difficult to obtain, and which should be reserved for those cases in which they are absolutely necessary.

Owing to the relatively high incidence of secondary hypochromic anæmia in any cross section of the community, it is not surprising that the development of pernicious anæmia has been described in patients suffering from the former disease. Edward B. Miller and William Dameshek have reported two such cases,[1] and a few similar reports have appeared in the literature. These authors have suggested that the common denominator in the two conditions (pernicious and hypochromic anæmia) may lie in a disturbance of gastric secretion giving rise to an achlorhydria (with a normal formation of intrinsic factor) which leads to an impaired absorption of iron, and then later to a true *achylia gastrica* and the development of pernicious anæmia. This may be, but it is quite possible that such a combination of the two types of anæmias is only accidental. It is unlikely that the administration of liver in these cases would have prevented the appearance of the *achylia gastrica*, and they cannot be reasonably used as an argument for the administration of liver in all cases of hypochromic anæmia. That most patients with pernicious anæmia require small and occasional doses of iron salts in addition to the liver, and that in some cases of pernicious anæmia a severe iron deficiency anæmia develops, usually owing to some complication such as malignant disease or hæmorrhage, also have no bearing on the administration of liver to patients with hypochromic anæmia.

[1] *Archives of Internal Medicine*, September, 1941.

Abstracts from Medical Literature.

PATHOLOGY.

Incidence of Occult Adenocarcinoma of the Prostate.

EDGAR BARON AND ALFRED ANGRIST (*Archives of Pathology*, November, 1941) state that the incidence of carcinoma is always higher for the pathologist than for the clinician. This discrepancy is more outstanding in regard to prostatic carcinoma than in regard to other forms of cancer, since the tumours are often too small to be felt or seen clinically. The difficulty in diagnosis exists often at autopsy, with the entire prostate excised and sectioned, as many of the carcinomatous tumours are small and can be found only on careful microscopic examination. Different authors have reported the incidence of occult carcinoma with figures ranging from 13·9% to 29·4%. The authors therefore studied two series of cases. In the first series sections were taken at random from prostates of 364 men over the age of fifty. Analysis of this first group reveals the incidence of adenocarcinoma to be 14·8%. In 9·9% of the instances of carcinoma the tumours were small and classified as occult. Of the patients 4·9% died of extensive prostatic adenocarcinoma with metastases, making a total incidence of 14·8%. The second series consisted of 50 unselected consecutive autopsies on men over fifty years of age. The prostate was examined completely and the incidence of occult carcinoma was found to be 46%. In this group prostatic carcinoma was not the cause of death in any case. Metastases were not found and the diagnosis of carcinoma was not made at the time of autopsy. The incidence of occult carcinoma increases with age. Although inflammation and adenomatous hyperplasia likewise increase with age, the lesions could not be definitely correlated. Miniature carcinoma usually occurs in an area of atrophy. Carcinoma is found in the lateral lobes or at the junction between lateral and posterior lobes more often than in the posterior lobe proper. Because of the high incidence, the small size of the tumours and the fact that metastases are not found in these cases, it must be assumed that the tumours are very slow growing and seldom become a factor in the cause of death.

The Spread of Tubercle Bacilli by Sputum, Blood and Lymph in Pulmonary Tuberculosis.

ESMOND R. LONG AND ROBERT FAUST (*The American Journal of Pathology*, September, 1941) have studied a series of 126 cases of pulmonary tuberculosis to determine the relative parts played by sputum, blood and lymph in the dissemination of tuberculosis throughout the body. The tonsils and intestine were chosen as measures of infection by sputum, and the upper cervical, paratracheal, axillary, mesenteric and inguinal lymph nodes as measures of lymphatic spread, with recognition of the fact that all of the organs named may be infected hæmatogenously. Hæmatogenous spread was studied in the spleen, liver, kidneys, adrenals, myocardium and pancreas. Figures are given showing the frequency of infection in the several organs named. A high positive correlation existed in tuberculosis of the tonsils, upper cervical lymph nodes, intestine and mesenteric lymph nodes, presumably indicating sputum infection of the organs of the alimentary tract and secondary involvement of the draining lymph nodes by the lymph stream. Of the several series of lymph nodes examined, the superficial inguinal nodes were infected the least frequently. Their incidence of tuberculosis was considered a rough measure of the extent of hæmatogenous spread to the lymph nodes, which could be subtracted from the total incidence of infection of the other lymph nodes to furnish a rough minimal index of the involvement of the latter by way of the lymph stream. The tonsils and intestine were tuberculous in about three-fourths of the cases, and the upper cervical and mesenteric lymph nodes in almost three-fourths. Tubercles were found in the axillary nodes in one-third and in the inguinal nodes in more than one-sixth of the cases of the series. A difference in the incidence of hæmatogenous infection was apparent on examination of the viscera. Single section examination showed tubercles in approximately 66% of the cases in the liver and spleen, in 25% in the kidney, 16% in the adrenal, and 2% each in the myocardium and pancreas. The incidence of generalized amyloidosis was 8%, and of advanced fatty infiltration of the liver 26%.

Kaposi's Disease.

DOUGLAS SYMMERS (*Archives of Pathology*, November, 1941) has observed twenty-five patients with Kaposi's disease, and he describes eight of the cases in detail. With regard to the histogenesis of the lesion, he is convinced that the unit of growth in the cutaneous nodules of Kaposi's disease is the fibroblast. The growth springs from those fibroblasts which lie loosely in the papillary, or superficial, layer of the derma, where normally they are relatively well nucleated and produce collagenous fibrils in small numbers rather than from the fibroblasts in the deeper or reticular layer of the derma, where normally they are poorly nucleated and produce collagenous fibrils in large numbers arranged in thick bundles. The mucosal growths most probably arise from the subepithelial fibroblasts, although there is no definite evidence to offer on this phase of the subject or on the origin of the presumably non-metastatic growths in the solid viscera. The fibroblast determines the growth behaviour of each of the phases by which Kaposi's disease may be characterized: (*a*) The fibroblast may produce young argentophilic collagenous fibrils which reinforce the mature collagenous bundles in such manner as to aid in the process of healing. (*b*) The fibroblast may maintain a low, almost stagnant capacity for growth over a long number of years. (*c*) The fibroblast may suddenly assume active malignant properties and terminate life by widespread destruction of tissues through the process of metastasis. Histological study of the younger growths shows that from the outset two opposing factors are operative, one tending to bring about replacement of the nodules by the production of collagenous fibrils, the other tending to maintain the capacity of the nodule to grow, but at an extremely slow rate. Excluding such incidental features as hæmorrhagic extravasations between the fibroblasts and deposits of pigment following destruction of red blood cells, the histological appearance of the well-developed growths in Kaposi's disease is scarcely to be distinguished from that of the familiar spindle-cell sarcoma. Whereas the familiar spindle-cell sarcoma almost always grows rapidly and without restraint, the progress of the spindle-cell growths of Kaposi's disease is retarded almost to the point of stagnation. In other words, the growths in Kaposi's disease are histologically malignant but clinically benign. The process of spontaneous regression and healing in the cutaneous lesions of Kaposi's disease is probably initiated by the sudden release, traumatic or otherwise, of large numbers of red blood cells followed by injury to or destruction of neighbouring fibroblasts, then by regeneration of fibroblasts and finally by connective tissue replacement. The smaller and presumably younger nodules in Kaposi's disease are permeated by a complex network of argentophilic reticulum which serves primarily as a mechanical support for the fibroblasts.

Idiopathic Cardiac Enlargement Occurring in Infants and Children.

CLINICAL and autopsy findings in three cases of cardiac enlargement in infants are described by J. Marshall Neely (*Annals of Internal Medicine*, October, 1941). Evidence is presented to support the contention that, while the gross and microscopic changes in the heart are in each instance consistent with the diagnosis of idiopathic cardiac hypertrophy, the primary cause of these changes is chronic interstitial pneumonitis with secondary cardiac hypertrophy. It is suggested that the rapidly dwindling group known as idiopathic cardiac hypertrophy will decrease still further if more attention is given the lungs clinically and at autopsy. Chronic pulmonary emphysema as the compensatory change in interstitial pneumonitis adds to the load placed on the right side of the heart. Cardiac enlargement in infants may be due to many and various causes. If such an entity as congenital idiopathic cardiac hypertrophy exists, it must be so classified only after due consideration is given to all the possible causes.

The Effects of Continued Administration of Sulphathiazole and Sulphapyridine on Monkeys.

DAVID R. CLIMENKO AND ARTHUR W. WRIGHT (*Archives of Pathology*, November, 1941) have administered sulphathiazole and sulphapyridine in doses from 0·5 gramme per kilogram per day up to 10 grammes per kilogram per day to monkeys for a maximal period of twenty-eight days in order to obtain some evidence of the comparative toxicity of these two compounds. The drugs were administered by stomach tube as milk suspensions at eight-hour intervals throughout the entire period of medication. Daily observations of blood concentrations were made. At a dose level of 0·5 gramme per kilogram per day animals given sulphapyridine died on the thirteenth, fourteenth and twenty-fourth days of medication, respectively. Hæmaturia was present in all. At post-mortem examination, urolithiasis, degenerative changes of the tubular epithelium, particularly of the collecting tubules, pyelitis and cystitis were observed.

Monkeys receiving the same dose of sulphathiazole showed no ill effects during the twenty-eight days of medication. One animal of the latter series, killed on the twenty-ninth day for necropsy, showed no significant pathological changes other than slight œdema of the kidney and a chronic inflammatory process of the renal pelvis. The difference between sulphathiazole and sulphapyridine disappeared when the dose level was raised; at and above one gramme per kilogram per day fatalities occurred and severe renal lesions were observed in both series. These manifested themselves as parenchymatous and fatty degenerative changes of the epithelium of the collecting tubules, associated with the presence of crystalline material, focal necrosis and focal inflammation and ulceration, necrosis and desquamation of the epithelial elements of the larger collecting tubules. The renal pelves showed acute inflammatory reactions associated with submucosal hæmorrhages. The severity of the lesions varied directly with the height and duration of the concentration of the drug in the blood. The dose range employed in this series approximates ten to two hundred times the usual therapeutic range.

MORPHOLOGY.

The Retroduodenal Artery.

L. EDWARDS (*The Anatomical Record*, November, 1941) states that as a result of the apparent frequency in occurrence and surgical importance of a rather conspicuous branch of the gastro-duodenal artery, a description of which is not found in the standard text-books of anatomy, he investigated it in a hundred cadavers. He gives a report of this investigation. The artery was found in almost all of the hundred bodies examined. It usually arose as a branch from the gastro-duodenal artery, but in four cases the gastro-duodenal and retroduodenal arose as a common trunk from the hepatic artery, and in three it sprang from an accessory hepatic artery which branches from the superior mesenteric artery. In no instance was it found arising from the superior pancreatico-duodenal or from the normal hepatic artery. In all bodies in which it was present, it lay in intimate relation with the pancreatic portion of the common bile duct. In its descent along the posterior medial surface of the descending portion of the duodenum it lay parallel to and just to the right of the duct, and at the point where the latter penetrated the wall of the duodenum, the artery crossed its posterior surface to arch to the left to anastomose in most cases with the posterior branch of the inferior pancreatico-duodenal artery. In 20% of the cases, however, the retroduodenal artery terminated in minute branches to the pancreas and duodenum.

Cell Columns of the Spinal Cord.

G. J. ROMANES (*Journal of Anatomy*, October, 1941) has made a study of the adult anatomy and development of the motor-cell column in the ventral horn of the cervical enlargement in the rabbit in relation to the developing peripheral structures. Four chief stages were noted. The first was characterized by a thickening in the ventral part of the germinal epithelium of the neural tube to form a ventral horn. In the second there was an outgrowth of processes from the ventral horn cells, the latter grouping themselves together to form longitudinal aggregations. In the third there was a secondary splitting of these aggregations into subsidiary columns of cells coinciding with their connexion to the muscles which they supply, but prior to reflex activity. The fourth stage was marked by the appearance of coordinated neuro-muscular activity leading to contraction of the peripheral muscles. In this stage true Nissl granules appear in the cytoplasm of the ventral horn cells. The author found that the establishment of neuromuscular connexions, which are distinct only in the last stage, proceeds peripherally from segment to segment along the limb, a new column appearing as each segment is innervated. Thus the columns are embryologically related to segments of the limb, and there is evidence in the adult to suggest that such a functional relation exists, though it is not complete owing to the unsatisfactory nature of the chromatolytic reaction.

Changes in the Posterior Lobe of the Pituitary after Dehydration.

R. C. HICKEY *et alii* (*The Anatomical Record*, November, 1941) state that while it is now greatly accepted that the posterior lobe of the pituitary gland exerts an important influence on water exchange, much less is known about the influence of water exchange on the posterior lobe. They state that a few experiments of previous investigators show that the hormonal content decreases after water deprivation, and they extend these observations by further research. They find that dehydration diminishes the antidiuretic potency of the posterior lobe and that the number of intracellular osmiophilic droplets in the posterior lobe is independent of the antidiuretic potency or secretory activity of the gland, and of the degree of dehydration of the animal.

Nerve Endings in Avitaminosis E.

I. R. TELFORD (*The Anatomical Record*, October, 1941) investigated the effect of the lack of vitamin *E* on the motor nerve endings in the skeletal muscles of rats. It was found that the skeletal muscles from rats deficient in vitamin *E* with only a slight degree of degeneration showed no appreciable loss of nerve endings, but the striated muscle with considerable damage revealed a marked reduction in number of nerve terminals. Widespread necrosis of long standing caused a complete loss of nerve terminations in the degenerated muscle fibres. The number of nerve endings returns to normal upon recovery of the muscle fibres from the dystrophic changes. The vitamin *E* deficiency *per se* does not affect the number of nerve endings, but only as the deficiency is reflected in the skeletal muscle degeneration.

End Bulbs in Human Spinal Cord.

J. MINCKLER (*Archives of Neurology and Psychiatry*, January, 1941) gives an account of the normal morphological characteristics of end bulbs or terminal boutons about the nerve cells of the spinal cord in man and their reactions to pathological conditions. Counts of the nerve terminals of the human spinal cord show that proportions of the various morphological "types" of boutons (small loops, large loops, filamented loops, fibrillated bulbs and opaque or granular masses) remain about the same regardless of age. In general, granular forms are relatively more numerous in persons of middle age or older. Autolytic processes, operating up to twenty-one hours, appear to be of little importance in the production of changes in bouton morphology demonstrable with the technique used.

Enumeration of Betz Cells and Pyramidal Tract Fibres.

A. M. LASSEK (*Journal of Comparative Neurology*, April, 1941) found an average of 18,845 Betz or giganto-pyramidalis cells in the cortex of four monkeys (*Macacus mulatta*). Approximately 554,000 pyramidal tract fibres were counted at the level just above the motor decussation. The pyramidal tract of the monkey is primarily composed of minute axones. There are a small percentage of medium-sized axones, but no large ones such as are present in the dog or man. On the basis of evaluation of certain anatomical, numerical and experimental research there is a strong possibility that the Betz cells of the monkey may not give origin to all the component fibres found within the pyramids.

Arrangement of Fibres in the Spinothalamic Tract.

T. A. WEAVER AND A. E. WALKER (*Archives of Neurology and Psychiatry*, November, 1941) state that the segmental arrangement of the fibres of the spinothalamic tract (pain path) in the spinal cord is the same in man as in the monkey. In general, as higher levels in the spinal cord are reached, fibres from lower segments tend to become concentrated laterally and dorsally within the antero-lateral column, and fibres from higher levels are situated more medially and inferiorly, although there is no absolute segregation at any level. Within the medulla, fibres from the lower levels are concentrated at the periphery of the bulb, whereas fibres from the cervical region lie medially. Although there is evidence that such an arrangement exists, the topical localization of the fibres in the pons, the mid-brain or within the *nucleus ventralis posterior* of the thalamus could not be demonstrated by the methods used in this investigation.

Microscopic Differences in Bones of Different Species.

D. J. GRAY (*The Anatomical Record*, October, 1941) has investigated the various microscopic characteristics which serve to identify bone of different species. The medico-legal importance of this is of course apparent. In the animals which he studied the average length of lacunæ in bone was found to furnish the best basis for distinguishing human bones from those of lower animals. The lacunæ of the human femur are of greater average length than those of the dog, cat, rat or guinea-pig, and the lacunæ of the human parietal bone are longer than those measured in the corresponding bone of other animals. The author also made counts of the number of canaliculi which arise from the lacunæ, and he finds that it is possible to distinguish the human parietal bone from the parietal bones of all other animals studied. The number of canaliculi per lacuna in the human parietal bone is less than in the parietal bone in other animals.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A meeting of the Medical Sciences Club of South Australia was held at the University of Adelaide on July 4, 1941.

Immunization against Whooping Cough.

Dr. A. H. Finger read a paper on "Immunization against Whooping Cough". He stated that the spread of whooping cough could not be controlled by the isolation of sufferers, so that a method of mass immunization was essential. The earlier vaccines had failed, but since the recognition by Leslie and Gardner in 1931 of antigenically different phases of *Hæmophilus pertussis* potent vaccines had been prepared from organisms freshly isolated from patients with early infections. It appeared important that the method of preparation should involve the least possible interference with the surface antigens contained in the capsule of the virulent Phase 1 organisms.

Large doses, averaging 8×10^{10}, were necessary. The Americans gave this average dose in three weekly injections. In Australia those who had used the Commonwealth Serum Laboratories product found five weekly injections more suitable, commencing with 5×10^9. Reactions, local reddening and induration and mild general malaise, occurred in a small proportion of children, but were generally slight and transient. The usual time to immunize a child was in the seventh month of life. The Americans advocated a dose each succeeding year to maintain immunity.

The assessment of results was particularly difficult in whooping cough owing to its low attack rate and entirely unpredictable course. Sauer, Kendrick and Eldering and others in America had published results of large, well-controlled series which indicated a protection, after three months, in 85% of those vaccinated. This was now generally accepted in America.

The value of vaccines and human serum in the prevention of whooping cough after exposure and in the treatment of the disease was very doubtful, being largely a matter of clinical impressions, and most reports had been statistically valueless. The thing to be done was the vaccination of the mass of infants, as was standard practice in parts of the United States of America.

A meeting of the Medical Sciences Club of South Australia was held at the University of Adelaide on August 1, 1941.

Cervico-Facial Actinomycosis.

Dr. N. E. Goldsworthy presented a paper on "Ætiological Aspects of Cervico-Facial Actinomycosis". He stated that actinomycosis should be included in the differential diagnosis of any swelling or abscess in the region of the angle of the jaw, because it was not a very rare disease and it might simulate such diverse conditions as sarcoma and simple pyogenic abscess. On this latter account it was usual to recognize two clinical types of cervico-facial actinomycosis: (i) the slow and indurated, and (ii) the subacute and acute purulent type. The work upon which these remarks are based was related mainly, but not exclusively, to the second type.

By far the commonest species of actinomyces found in these lesions was the microaerophilic and strictly parasitic *Actinomyces bovis* (Wolff-Israel) (synonym *Actinomyces israeli*). The biological characters of this microorganism were incompatible with a free existence; it was micro-aerophilic, and unlike the spore-bearing anaerobic rods it did not possess resistant spores. Hence it was unlikely that it would be recovered from grains and grasses—in fact, it never had been isolated from sites other than the animal body.

As long ago as 1887 Israel had drawn attention to his finding portion of a decayed tooth in an actinomycotic abscess of the lung, but it was not clear that he realized the likely ætiological relationship between the tooth and the abscess. Others more recently had made similar observations which served for implying or suggesting that (*a*) *Actinomyces bovis* might exist in the mouth before infection is set up, and that (*b*) its mere presence in the mouth was but one factor in the ætiology of actinomycosis.

In routine examinations of pus from abscesses in the cervico-facial region the relatively frequent occurrence of *Actinomyces israeli* in such pus and the uniform history associated with these infections were striking. In nearly every instance the patient had had a tooth removed, healing had been slow, and within one to six weeks a swelling had appeared on the face in the region of the site of extraction. This strongly suggested that infection was autogenous and that trauma was a necessary preliminary to clinical infection.

In an attempt to support this suggestion Dr. Goldsworthy had isolated and compared the biological characters of strains from (*a*) clinically "normal" mouths and strains from (*b*) actinomycotic lesions. As far as could be determined, these two sets of strains were identical.

Dr. Goldsworthy said that it was therefore reasonable to discard the old views of the ætiology of human actinomycosis and to substitute the views discussed by him: that infection was autogenous and that trauma was a necessary and preliminary step in the process of infection.

THE MEDICAL DEFENCE SOCIETY OF QUEENSLAND.

The annual meeting of the Medical Defence Society of Queensland was held at British Medical Association House, Wickham Terrace, Brisbane, on February 11, 1942, Dr. S. F. McDonald, the Vice-President, in the chair.

Annual Report of Council.

The annual report of the council for the year ended December 31, 1941, was received and adopted on the motion of Dr. J. Lloyd Simmonds, seconded by Dr. R. Charlton. The report is as follows.

The council has pleasure in presenting the following report of the Medical Defence Society of Queensland for the year ending December 31, 1941.

Membership.

The total membership of the Society is 386, exclusive of 17 members whose subscriptions for 1941 are outstanding. Our gains have been: new members, 16; members reinstated, 14; making a total of 30. Our losses have been: resignation, 1; left the State, 8; deceased, 5; unfinancial, 17; making a total of 31. A total loss of one member has resulted during the year. Fifty-two members are on duty with His Majesty's forces.

It is with regret we record the deaths of the following members: Major H. C. Whittle, who died on active service abroad; the Honourable C. F. Marks, M.D., one of our original members; Major J. L. Selwood, who was on full-time home service with the forces when his death occurred; Dr. E. Elmslie Brown and Dr. F. C. Bechtel.

Office Bearers and Councillors for 1941.

The following office bearers were elected:

President: Dr. Alex. H. Marks.

Vice-President: Dr. S. F. McDonald.

Honorary Secretary: Dr. Neville G. Sutton.

Honorary Treasurer: Dr. L. P. Winterbotham.

Councillors: Dr. A. G. Anderson, Dr. Gavin H. Cameron, Dr. G. P. Dixon, Dr. E. R. Row, Dr. John Hardie, Dr. G. W. Macartney.

The retiring councillors were Dr. Kenneth Wilson, Dr. R. G. Quinn and Dr. Horace Johnson, all of whom are on active service with His Majesty's Forces and had tendered their resignations prior to departure. Letters of appreciation of their services were sent to each one of them.

Dr. E. R. Row, Dr. John Hardie and Dr. R. A. G. Malcolm were elected to fill the vacancies on the council.

Messrs. R. G. Groom and Company (Chartered Accountants, Australia) were appointed auditors for the ensuing year.

Medico-Legal.

No cases were submitted to the Society during the year, and the majority of the business was dealt with by flying minutes.

Finance.

The total assets of the Society are £5,866 9s. 3d. Income from investments amounted to £216 10s. 7d., and the sum of £208 7s. 3d. was received from entrance fees and annual subscriptions. The income for the year amounted to £424 17s. 10d., and the total expenditure was £41 19s. 9d. The net surplus for the year amounted to £382 18s. 1d.

(Signed) A. H. Marks,
President.

Balance Sheet and Financial Statement.

The balance sheet and financial statement for the year ended December 31, 1942, were received and adopted on the motion of Dr. L. P. Winterbotham, seconded by Dr. N. G. Sutton.

Election of Councillors.

Dr. A. H. Marks, Dr. L. P. Winterbotham and Dr. Kenneth Wilson, being the only nominees for the vacancies on the council, were declared elected.

Election of Auditor.

Messrs. R. G. Groom and Company, Chartered Accountants (Aust.), were reelected auditors for the Society for the ensuing year.

Commonwealth War Loan.

It was resolved that a further sum of £250 should be invested in the new Commonwealth War Loan.

Correspondence.

THE REPAIR OF FLEXOR TENDONS OF THE FINGERS.

SIR: Dr. Thomas King's remarks on the repair of flexor tendons of the fingers in THE MEDICAL JOURNAL OF AUSTRALIA, February 21, will be read with the greatest interest by all concerned with the treatment of these difficult cases. H. B. Yates's appeal, "Is there a single surgeon in the land, general or orthopædic, resident medical officer, past or present, who has succeeded in establishing a return of movement in the interphalangeal joints after any method?" will, I am sure, be replied to in the affirmative by more than one surgeon.

While I have had a number of failures, I also have a small series of successes with primary suture. Though my series is too small for publication, perhaps my best case, showing full and perfect return of function after division of both flexor tendons at the middle of the proximal phalanx, which was obtained by using methods which are by many condemned, may be of interest. Details are as follow:

Miss D.O., twenty-one, a worker in a cordial factory, was injured by a bursting bottle in a small town twenty miles away, on July 28, 1937. After treatment by the ambulance she was brought to hospital and was operated on (in the theatre—not the casualty room) about four hours after the injury.

There was a nearly transverse incised wound one-quarter of an inch distal to the proximal crease of the middle finger of the right hand. The incision had penetrated to the bone of the phalanx and had completely severed both the *sublimis* and *profundus* tendons and the fascial tunnel.

The wound was excised and the tendons were united with catgut. Both the *sublimis* and the *profundus* were united. The *profundus* was united with a Bunnell suture, the two slips of the *sublimis* being united with simple through-and-through sutures. Sufficient access was obtained without enlarging the incision. After suturing had been performed the osteo-fascial canal was deliberately divided for half an inch above and below the line of incision. The wound was swabbed with acriflavine and sutured with interrupted horsehair, and the hand put up in plaster extending along the forearm to the elbow, with the finger in full flexion.

No movement was attempted until the ninth day, when the cast was removed and movements were commenced. There was a little suppuration, a very small amount of infection around the horsehair sutures which cleared up immediately they were removed. She was discharged from hospital on August 19, at that stage being able to extend her finger to about 90°.

Active movements were continued, the patient using her own muscles. No massage or any other treatment was given.

By six months recovery of function was perfect. She was able to play the piano equally as well as before her accident.

It will be noted that in this case, contrary to the usual advice, catgut was used and no movement was attempted until the ninth day. Also the fascial tunnel was freely opened above and below the point of division of the tendon.

Sterling Bunnell (*The American Journal of Surgery*, February, 1940) referring to primary suture, says that the fascial tunnel should be slit up laterally to allow it to expand sufficiently to accommodate the swelling necessary for tendon healing. The few reports of successful healing all mention either that no attempt is made to repair the sheath (*British Medical Journal*, July 6, 1941, page 138—a letter by three surgeons quoting five successful cases), or that actually slitting up the tendon sheath was performed. In a series of cases quoted by Betts, of Adelaide (THE MEDICAL JOURNAL OF AUSTRALIA, November 9, 1940, page 457) the best results quoted are 60% of function, but it appears from his article that either no attempt was made to interfere with the fascial tunnel or it was intentionally sutured.

The experimental work of Garlock (*Annals of Surgery*, 1927, Volume LXXXV, page 92) partly explains why some primary sutures succeed and others fail. Garlock found that tendon repair takes place by a growing in of fibroblastic cells into the fibrinous mass which surrounds the cut tendon ends. There must therefore result a mass of adhesions involving the tendon ends and all surrounding structures. Garlock showed that these fibroblastic cells are so soft that up to the fourth day they can be torn through with the greatest ease. After the fourth day they begin to get a little strength, and by the ninth day are strong enough to stand a certain amount of tension. To get a good functional result one must be able to tear across or stretch the adhesions between the tendon itself and the surrounding structures while not breaking those uniting the tendon ends. Most surgeons rely on an unabsorbable suture to unite the tendons and early movement to break down the other adhesions. Garlock used catgut, the effect of which was to produce an excessive outflow of fibroblasts around the suture material. However, movement could not be commenced until these adhesions were strong enough to hold, that is, before the ninth day. Garlock also made the interesting observation that once movement had commenced, reepithelialization of the tendon and its sheath took place. Presumably this arose from an outgrowth of epithelial cells from the tendon itself, which spread and united and formed a sac. However we speculate on how this epithelialization takes place, Garlock's experiments showed that whereas in the early stages there was a dense mass of adhesions binding everything together, in the later stages there was a complete tendon in a new sheath, with a continuous synovial membrane and no adhesions.

Garlock's work has been criticized, and perhaps with some reason, mainly because he used catgut. To my mind, however, the most important consideration is not what suture material is used (provided that with catgut movement is not commenced before the sixth day). There is one vital point on which success or failure depends, namely, what is done with the fascial tunnel. If it is widely opened above and below the line of suture, success is possible; if it is left alone, or, worse still, sutured, failure can be expected.

A little reflection will explain why this is so. Ordinary wounds of the palmar surfaces of the fingers, due probably to their rich blood supply, heal better than almost in any other part of the body. Why should the same site be notorious as the worst possible part of the body for healing of tendons? The answer lies in the situation and structure of the fascial canal. This is a very strong, almost avascular structure. It completely walls off the processes going on inside it from those going on outside. Inside is an avascular tendon; the rich blood supply outside the fascial tunnel has no access whatever to the structures within the tunnel. Garlock's experiments show that the tendon itself takes almost no part in its own repair. The fibroblastic cells which appear in the clot surrounding the tendon ends come from structures outside it. If the tendon sheath is widely opened, not only is there a much greater area from which these fibroblastic cells can grow in, but the area is also exposed to the reparative processes arising from the rich blood supply of the surrounding parts.

Is it not possible that the synovial sheath of the fascial tunnel actually prevents any fibroblastic cells from growing into the tendon mass? Is it not, therefore, only logical to open up the fascial tunnel widely? Indeed it might even favour repair best if portion of the tunnel were completely excised. This would remove the special anatomical characteristics of this part and restore to it those generally prevailing elsewhere. In fact, owing to the exceptionally rich vascular supply, conditions in this respect would actually be better than elsewhere. This osteo-fascial tunnel is not essential for function; reasonably good function can be secured without it. In any case, if it were excised and repair of the tendon took place, a new fascial tunnel could be expected to form in response to the stresses and strains produced by the action of the tendon.

I have been waiting for some time for a case in which I could try this method of complete excision of the fascial tunnel for half an inch above and below the tendon ends. In my practice such cases do not occur very frequently.

However, I am convinced that if this were done, healing of these flexor finger tendons should be very little different from what it is in other tendons.

Yours, etc.,
T. M. S. HALL.

421, Ruthven Street,
Toowoomba,
Queensland,
February 24, 1942.

FIRST AID.

SIR: Now that the study of first aid is so fashionable. I would be glad of some enlightenment by any of your readers on two debatable points.

1. Use of strangulator in hæmorrhage cases. The "St. John's" book teaches that this must not be used except when part of a limb has been cut or torn off.

In the case of a torn femoral or popliteal artery, is the danger of damage by a strangulator more to be feared than the danger of excessive hæmorrhage due to delay caused by the "first-aider" (usually very inexperienced) having possibly to improvise and then apply a tourniquet to the correct pressure point?

It is not easy for an amateur to apply the pad of a tourniquet quickly and correctly, whereas the application of a strangulator requires very little time and skill.

I have never seen a tourniquet used in the operating theatre, but have often seen strangulators used, and never with any ill effect.

It has been my custom to teach first aid pupils to apply a strangulator immediately for very severe hæmorrhage; then to apply a tourniquet at their leisure and to remove the strangulator if and when the tourniquet has been placed correctly. Many examiners of first aid pupils, however, do not agree with this teaching.

2. Poisoning by narcotic drugs. It has been taught for many years, not only in first aid books, but in medical books as well, that the patient must be prevented from going to sleep. The patient has to be walked about and flicked with wet towels to obtain this result. I would be glad to know the rationale of this treatment, which to me appears to be quite wrong. I would also like to know why the same thing is not recommended in cases of poisoning by alcohol, belladonna and the poisons concerned in diabetic and uræmic coma *et cetera*.

Yours, etc.,
"ROSEVILLE."

March 9, 1942.

A FRACTURE SERVICE.

SIR: From the "Bulletin of War Medicine", Number 1, is quoted an article giving the percentage of wounds of limbs in eleven million wounded as 68%. We may ask whether 68% of the training of our medical students in this period of total war effort is devoted to wounds of the limbs.

The time seems opportune to re-read the Report of the Committee on Fractures (British Medical Association), published in the Supplement to the *British Medical Journal* of February 16, 1935, and to note even at some length certain most relevant abstracts as itemized below:

1. As a result (i.e. of the efforts of Sir Robert Jones *et al.*) it soon came about that the majority of fractures were under the continuous care of experts, and so far as possible were under the same continuous control throughout their treatment. Unfortunately this fine organisation has largely disappeared, the treatment of fractures in the majority of hospitals has not materially altered and in few centres is there any organisation superior to that which existed 20 years ago.

2. The Committee has carefully investigated the fracture services of the large hospitals in this country, and the replies to the Committee's questionnaire show that in the majority of cases there is no efficient organisation.

3. In the opinion of the Committee, the essential conditions of an organised fracture service can be summed up under four headings—segregation of cases, continuity of treatment, after-care and unity of control.

4. It does appear to be vitally important that every hospital which proposes to deal with fractures should segregate its cases and establish one and only one organisation. There is probably no hospital in the country which deals with such a large number of cases as to demand the maintenance of more than one organisation.

5. Inpatients and outpatients should be treated by the same staff.

6. No fracture organisation can be complete without adequate "follow-up" measures.

These findings and opinions above are confirmed and enlarged by the more recent and authoritative Report of the Inter-Departmental Committee of the Home Office, Ministry of Health and the Scottish Office, 1939: "Rehabilitation of Persons Injured by Accidents".

I suggest that we require now a standing orthopædic body which shall inquire into all war matters orthopædic, shall collate results, publish reports and form a centre of criticism and discussion; and that one of its first duties be an investigation into and classification of hospital fracture services.

It would be insisted, for example, that students only receive their fracture training at class 1 fracture centres.

I don't know how many hospitals achieve the four conditions of the British Medical Association Fracture Committee, but, just to promote discussion, I would like to mention that at the St. George District Hospital, thanks to the cooperation of the general surgical and other members of the honorary staff, all fractures and all bone surgery are under one control, both in-patient and out-patient, and the bulk of the in-patients are in two special wards.

The size of the clinic is considerable, averaging recently in-patients 30, out-patients 55 per week, and I feel that there is at least one hospital whose standard of organization approaches that suitable for medical students. There are others; but what of the teaching hospitals?

In conclusion, it is desired to emphasize that there is question in this article, not of individuals, but of organization. There are many worse things than "not knowing".

It is hoped that others will forward reports of other hospital organizations and a profitable discussion be built up.

Yours, etc.,
CRAWFORD MCKELLAR.

Harley,
143, Macquarie Street,
Sydney.
March 11, 1942.

A RUDIMENTARY CERVIX AND CÆSAREAN SECTION.

SIR: In your issue of June 21, 1941, there is a report of a case by Dr. Ellen M. Kent Hughes describing a rudimentary cervix necessitating Cæsarean section. It brought to my mind a very interesting case which I saw in consultation thirteen years ago. On April 16, 1928, I was asked by the late Dr. Stuart McKee to see a patient who was thirty-four years of age. She was eight and a half months pregnant. Four years before she had had a child down in the Pacific islands. She was in a state of preeclampsia and was very ill. I advised him to induce labour at once. Four days later Dr. McKee rang me to say that he and a colleague could not find the external os, under anæsthesia, with a speculum in the vagina. I was asked to see her again. I examined her under anæsthesia and a most thorough search with specula and strong headlights failed to reveal any sign of even a dimple which could lead one to a cervical canal. After half an hour's most careful investigation I was forced to the conclusion that the cervical canal, possibly as the result of injury after her last confinement, had completely cicatrized. In view of the patient's urgent condition with threatened eclampsia I did an immediate Cæsarean section and delivered a living girl child. After emptying the uterus I found the internal os and dilated the canal from within, establishing drainage through the cervix, which had apparently been completely occluded. Further inquiry showed that the child she had had four years before was stillborn, but there was no evidence of any surgical interference as far as the patient knew. There must have been a considerable amount of operative interference at the delivery four years before to cause the cervix to cicatrize up completely. I have never, either before or since, seen a case in which I could not find some trace of a cervical canal. This was the only case in my experience where there was absolutely no trace of any external os.

Yours, etc.,
F. A. MAGUIRE.

Sydney,
March 12, 1942.

NATIONAL HEALTH.

SIR: Dr. F. M. Burnet, in his article on "The Biological Approach to Infectious Disease", states that he thinks a wealthy nation at peace could eliminate tuberculosis completely from its population within twenty years; also that he would have the gravest misgivings in supporting any such policy.

Now I agree with Dr. Burnet on the possibility of eliminating tuberculosis, and the reason for his doubting the wisdom of any such policy is obvious. The disappearance of resistance against that particular organism due to the absence of infection would make it likely that the reintroduction of the disease from outside the community would result in a disastrous epidemic.

It is a moot point whether the damage done by that epidemic would be greater than that which would have been done by the unchecked disease in the interval; but it is not important.

I would like to ask Dr. Burnet two questions:

1. Would his opinion be modified if it were possible to keep up the resistance of the population to the disease, in the absence of its clinical manifestations?

2. Is it possible for us to do this, or is it likely to become possible?

The continued use of attenuated tubercle bacilli or of the Vole bacillus might be a means.

The present trend of medical and lay opinion, backed by the possibilities of the miniature X-ray examination, makes it almost certain that attempts will be made to eradicate tuberculosis in the not so distant future, and as the success of such an event would be a financial gain of considerable benefit to the country, we may expect that it would be successful in eliminating tuberculosis.

These, therefore, are questions of great importance to this country.

Yours, etc.,
A. McQUEEN THOMSON.

Adelaide River,
Northern Territory,
March 12, 1942.

PHYSICAL FITNESS AND EFFICIENCY.

SIR: Your leader on the above subject, of February 28, recalls to one's mind a very pertinent address by Professor Cathcart, Professor of Physiology at Glasgow University. It is entitled: "The Physiological Approach to Fitness", and was published in the *British Medical Journal* of August 6, 1938.

The professor asks: What are we looking for? What are we trying to attain? He interprets the phrase "fitness" as "the building up of healthy human beings, well balanced physically and mentally and emotionally, who will be capable of all necessary adjustments to their immediate environment, be it of work or play".

Professor Cathcart agrees with the authors you quote, that this state of fitness requires physical training of some kind. But whereas the latter depend on the regimentation of those of military age, who are disciplined on Nazi, Fascist and Soviet lines, the professor introduces the psychological aspect.

This should appeal especially to the medical profession. We are told that the present war is a young man's war, and that nobody over forty can stand the strain and hardships of modern warfare. "It is probably true that the man who had well-developed muscles and who could use them was in greatest demand not so long ago. But today the qualities on which there is a premium are quickness, alertness, quick reaction time, intelligence." "The aim of the present physical fitness compaign lies in the hope to achieve a harmony of motion, a grace of carriage, a pride of body, a mental concentration and quickness of reaction, and a happiness and contentment which characterise the really fit."

"There is no short cut to this desirable state of physical and mental fitness. To attain it no amount of help, no amount of direction, no amount of guidance (and regimentation) will suffice, unless the willing co-operation of the trainee is obtained. People must want to be fit. They must be prepared to pay the price. The price that so many are unwilling to pay is steadfastness and discipline. It is relatively easy to start, but it is difficult to get people to continue in well-doing. So many want the final result without the necessary effort. They want the balance of posture, the perfection of rhythm, without the labour which goes to the building up of smooth reflex movement."

"The only exercises, in the end, which will be of value in retaining the pupils, are those which are creative, which either allow the performer to express something innate, by way of limb and body movements, or give rise to the real belief, that such systematic practice is creating a new body, a new control."

"The difficulty is to devise a suitable system. So far as children and those in their teens are concerned the system carried out by the Board of Education is sound."

"But what have we to offer the adolescent and the adult of all ages?" What is there to offer to the medical man who is not wanted after forty, except for an office job which adds still further to his unwantedness by still further reducing his bodily alertness? What have we to offer to the young medico, beginning with the hospital resident, to attain Professor Cathcart's idea of physical and mental fitness? It is so easy to make a start with tennis, golf, even bowls; some tackle squash racket, ju-jutsu, wrestling or punching the ball. But what does it lead to? In most cases it gives you that sense of well-being which is indicated by the creation of an increased appetite for food and drink. More harm than good may be done, since fitness as the object is totally overlooked.

If one may address oneself to the medical profession, as a whole, and in particular to those who do not wish to be found wanting at forty; or who, at their hospital retiring age, wish to "keep that schoolboy walk", the question might be discussed in the following light. Physical and mental fitness may be put on a par with a higher degree. The hankering after a higher degree comes to some of us. It is the desire to improve ourselves and to place ourselves on a higher level.

It is this "want" to become more fit which is the starting point. Then comes the question, are you prepared to pay the price? The price is to discipline yourself to the hard work required, which is quite different from the work of one's student days, when the fear of professor or lecturer acted as a stimulus. And so it is with physical fitness. Do you want to be fit above the average? Have you that extra amount of determination necessary to give the required time and the work to attain your object? Once your mind is made up, the question arises: how am I to proceed?

Here the experience of a man of three score and ten, proud of his schoolboy walk, and prepared to meet, as of old, all-comers with rapier or sabre, may be of help.

Let us go back to the "good old days" of our great-great-grandfathers, when every man of consequence wore at his side that light and sinewy rapier as part and parcel of his everyday dress. That weapon settled all disputes, even imaginary ones. It took the place of judge and jury; there was no appeal. The fighting with it, deadly as it was, was surrounded by conventions, the so-called ethics of duelling, which, compared with fighting in war, seemed suicidal. Perusal of Sabatini's historical novel "Scaramouche" shows well what this meant.

The skill required for such combat was the object of every man's education. Every boy started his fencing lessons before he tackled his alphabet. All through life a man was kept at his fencing exercises with a seriousness which proved that his very existence depended on his not relaxing in the skill with which the weapon had to be handled. Such fencing was a science as well as an art. Every movement, every action involved, was described, explained and demonstrated, and had to be acquired, with scrupulous accuracy.

The fencing seen nowadays is not fencing; it is a farce. We are told that sufficient can be learned in twelve or fifteen lessons to take one's place on the floor of a school of arms. But the technique and the tactics employed are often so unethical, indeed so unscrupulous, that, in the days of duelling, it would have stamped the perpetrator as an outcast amongst gentlemen. He would be refused to be met in a duel.

When Professor Cathcart says that there is no short cut to the desirable state of physical and mental perfection, he seems to have visualized the old-time practising and exercising in fencing, which meant years of serious study and practice, and, eventually, enabled a man of any age to throw down the gauntlet to any offender.

To sum up, the study and practice of fencing on scientific lines, which extends over years, will lead to a state of physical and mental well-being which is to be envied.

Yours, etc.,
ALFRED E. FINCKH,
President of the Sydney Amateur Fencing Cercle.

Sydney,
March 16, 1942.

SPRING CATARRH.

Sir: The case previously reported by me has not been referred to again until the heat of the summer has passed, as it practically has at present.

One eye—the left—has remained perfectly well, beyond a little redness of the conjunctiva, which, however, is smooth and pearly white under adrenaline. In the other—the right eye—there was a slight relapse, with trifling thickening during this summer. This too has practically passed away. At present any oculist examining the eyes would not find anything except a little papular enlargement at the outer part of the right eye, without practically any thickening. The right lid is a little thicker than the left, which is almost thinner than normal. The surface is quite smooth elsewhere.

As the duration of the case is apparently about three years, it is possible that the practical disappearance of the disease for the present may be the natural progress of this distressing condition. But the fact remains that in the case of the right eye the disease was gross and the thickening very great, and the continual use of the "Prontosil soluble" 2·5% was followed by immediate steady improvement in midsummer, and that the ocular conjunctiva has never been involved. The duration of the "Prontosil" treatment is two years. Furthermore, there has been no discomfort and his severe work was continual during the whole of this period. As there is no other effective treatment except operation, which is not always satisfactory, the probabilities are that the "Prontosil" was the effective agent. Though it must be stated that there is no evidence so far of the causation of this disease by any bacterial or other irritating agent, so Dr. Wilson, of Giza, informs me, I simply state the facts and people can judge for themselves.

Yours, etc.,

James W. Barrett.

103-105, Collins Street,
Melbourne,
March 16, 1942.

Naval, Military and Air Force.

APPOINTMENTS.

The undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 79, of March 12, 1942.

Permanent Naval Forces of the Commonwealth. (Sea-Going Forces.)

Extension of Appointment.—The appointment of Surgeon Captain William James Carr, C.B.E., is extended for a period of one year from 30th January, 1942, under the provisions of regulation 5 of the National Security Naval Forces Regulations.

Emergency List.

Appointment.—Surgeon Lieutenant-Commander Jack Robert Law Willis is appointed from the Retired List, dated 17th February, 1942.

Australian Imperial Force.

Australian Army Medical Corps.

To be Captain.—Captain (Temporary Major) C. R. Morton, 16th January, 1942.

To be Captains and are seconded.—Llewellyn Thomas Griffiths, Thomas Owen Beatty and Ian Haig McConchie, 3rd February, 1942.

Australian Military Forces.

AUSTRALIAN ARMY MEDICAL CORPS.

Seventh Military District.

Captain (Temporary Major) H. S. Jacobs, V.D., is transferred from 3rd Military District, with regimental seniority in accordance with Army seniority, and retains the temporary rank of Major, 4th February, 1942.

Captains (provisionally) T. R. Neville and N. J. O'Connor are transferred from 1st Military District, with regimental seniority in accordance with Army seniority, 4th February, 1942.

Honorary Captain J. S. T. T. Hill is appointed from the Reserve of Officers, 4th Military District, and to be Captain (provisionally), 21st January, 1942.

Captain (provisionally) G. Harris is transferred from Australian Army Medical Corps, 2nd Military District, 4th February, 1942.

Captain (provisionally) W. A. E. Robertson is transferred from Australian Army Medical Corps, 3rd Military District, 4th February, 1942.

Captain (provisionally) L. C. Lum is transferred from Australian Army Medical Corps, 4th Military District, 4th February, 1942.

To be Captain (provisionally).—Oscar Alpins, 13th February, 1942.

Eighth Military District.

The following officers are transferred from Australian Army Medical Corps, 1st Military District: Captains (provisionally) L. S. Davies and L. L. Grimmett, 23rd December, 1941; L. T. Moran, 1st January, 1942; and B. N. Adsett, 14th February, 1942.

Northern Command.

First Military District.

To be Lieutenant-Colonel (temporarily).—Major J. J. Power, D.S.O., 23rd December, 1941.

To be Major (temporarily).—Captain (provisionally) M. J. McKillop, 30th January, 1942.

To be Captain (provisionally).—John George Morris Beale, 13th February, 1942.

The resignation of Honorary Captain C. V. James of his commission is accepted, 6th February, 1942.

To be Honorary Captains.—Joseph Schwartz Barr-David and Bazel Henry Louis Grey, 5th February, 1942.

Captain (provisionally) L. Elias is retired, 16th February, 1942.

The notification respecting the appointment of Honorary Captain (now Captain (provisionally)) P. Black which appeared in Executive Minute No. 20/1942, promulgated in *Commonwealth Gazette* No. 28 of 1942, is withdrawn.

Majors M. G. Sutton and J. S. Smyth are appointed from the Reserve of Officers, 23rd January, 1942.

Honorary Majors P. A. Earnshaw and M. Geaney are appointed from the Reserve of Officers and to be Majors (provisionally), 23rd January, 1942.

Captain W. G. Oakeley is appointed from the Reserve of Officers, 23rd January, 1942.

The following officers are appointed from the Reserve of Officers and to be Captains (provisionally): Honorary Captains C. V. Hickey, N. V. Youngman, P. B. English, E. J. Burton, G. W. Mason, W. D. Ryan, A. N. Park, E. Bruce-Smith, A. Davison, E. G. Free, 23rd January, 1942; R. C. Dent, 9th February, 1942; and M. R. Lee, 12th February, 1942.

To be Captains (provisionally).—Vincent Charles Byrne and Emil John O'Sullivan, 20th February, 1942.

Eastern Command.

Second Military District.

Captain N278367 A. A. Abbie is appointed from the Reserve of Officers (A.A.M.C.), 22nd December, 1941, and to be Major (temporarily), 23rd December, 1941.

Captain C. A. McDermott is appointed from the Reserve of Officers (A.A.M.C.), 30th January, 1942.

Honorary Captain V. Goldrick is appointed from the Reserve of Officers (A.A.M.C.), and to be Captain (provisionally), 1st January, 1942.

To be Captain (provisionally).—Louis Elias Jabour, 24th November, 1941 (in lieu of the notification respecting the appointment of this officer which appeared in Executive Minute No. 232/1941, promulgated in *Commonwealth Gazette* No. 279 of 1941), Denis Brian Wightman, Mary Gwenyth Lusby, 12th February, 1942; Douglas James Passmore and N278529 Sydney George Iceton, 13th February, 1942.

To be Honorary Captains.—Charles Holden Wood, Ronald Macqueen, 30th January, 1942, and Stanley St. John Grace, 5th February, 1942.

The following officers are appointed from the Reserve of Officers (A.A.M.C.) and to be Captains (provisionally) from the dates shown: Honorary Captains N278486 C. L. Bear, 13th January, 1942; N278579 L. W. Tunley, 20th January, 1942; and N278619 D. A. Finckh, 29th January, 1942.

Major N278502 E. L. Hutchinson, D.S.O., is appointed from the Reserve of Officers (A.A.M.C.) supernumerary to the establishment of Majors, with pay and allowances of Captain, 2nd February, 1942.

To be Majors (temporarily).—Captains N57714 L. P. Hiatt, N280262 C. H. Gilbert, N274347 R. Huntley and Captain (provisionally) N273359 J. R. Black, 6th February, 1942.

To be Captains (provisionally).—Leonard Leslie Shortland, 19th February, 1942; Edgar Hughan Ross, Helen Margaret Inglis Braye and Kenneth Wakeford Alexander, 20th February, 1942.

To be Honorary Captains.—Joseph Skype, Murree Allen, 11th February, 1942, and Stuart Seaton Hammond Scougall, 12th February, 1942.

Southern Command.

Third Military District.

Captain T. H. Wilson is transferred to the Reserve of Officers (A.A.M.C.), 2nd February, 1942.

Captain (provisionally) D. J. Oldmeadow is transferred to the Reserve of Officers (A.A.M.C.), and to be Honorary Captain, 26th January, 1942.

The resignation of Captain (provisionally) F. J. McCoy of his commission is accepted, 1st January, 1942.

The following officers are appointed from the Reserve of Officers: Honorary Captains W. A. E. Robertson and to be Captain (provisionally), 9th July, 1940; and M. Salvaris and to be Captain (provisionally), 2nd February, 1942.

To be Captains (provisionally).—Edwin Archibald Holland and Samuel Simon Marshall, 13th February, 1942.

The resignation of Honorary Captain M. V. Clarke of his commission is accepted, 29th December, 1941.

To be Honorary Captains.—Kevin John O'Day, Donald Forsyth Lawson and Gerald Vincent Doyle, 5th February, 1942.

Lieutenant-Colonel J. H. Anderson, C.M.G., C.B.E., is transferred from the Unattached List and is seconded, 19th August, 1940 (in lieu of the notification respecting this officer which appeared in Executive Minute No. 194/1940, promulgated in *Commonwealth Gazette* No. 210 of 1940), and is placed on the Retired List, 1st March, 1942.

The following officers are appointed from the Reserve of Officers and to be Captains (provisionally): Honorary Captains W. A. E. Robertson, 9th July, 1940; R. A. Macdougall and A. C. Bell, 1st February, 1942; and N. R. Dale, 2nd February, 1942.

Fourth Military District.

To be Honorary Captain.—John Ernest Dornan, 6th February, 1942.

Honorary Captain L. C. Lum is appointed from the Reserve of Officers and to be Captain (provisionally), 1st January, 1942.

To be Honorary Captain.—Henry Arthur Goode, 6th February, 1942.

Western Command.

Fifth Military District.

Honorary Captain M. F. Williams is appointed from the Reserve of Officers and to be Captain (provisionally), 7th February, 1942.

Captain (provisionally) W14437 C. W. A. J. Schlink is transferred to the Reserve of Officers (A.A.M.C.), 2nd Military District, and to be Honorary Captain, 13th January, 1942.

To be Captain (provisionally).—W16653 Luan Hong Tan, 3rd February, 1942.

Royal Australian Air Force.

Citizen Air Force: Medical Branch.

The probationary appointments of the following Flight Lieutenants are confirmed: A. G. McGlynn (2722), F. W. Perrottet (2723), 2nd December, 1941; J. Hall-Johnston (2741), 16th December, 1941; A. S. Binns (2831), J. P. Cole (2832), G. M. Foote (2833), F. J. B. Drake (2835), G. C. V. Thompson (2836), 7th February, 1942; G. C. Corlis (2866), N. W. Martin (2869), M. A. O'Halloran (2870), R. G. Baker (2574), D. H. Le Messurier (2721), 28th January, 1942; F. H. Lord (2297), 18th February, 1942.

The probationary appointment of Pilot Officer J. G. Palmer (2891) is confirmed and he is promoted to Flying Officer, with effect from 15th January, 1942.—(Ex. Min. No. 43—Approved 6th March, 1942.)

National Emergency Measures.

MEDICAL EQUIPMENT.

The Sulphonamides.

THE Medical Equipment Control Committee desires once more to direct the attention of all members of the medical profession to the need for conserving supplies of the sulphonamide group of drugs.

The use of these drugs should be confined to streptococcal, gonococcal, pneumococcal and meningococcal infections, and to bacillary infections of the urogenital tract.

It is wasteful extravagance to use these drugs in any other condition. Despite this fact, from information received by this committee, it would appear that very many members of the medical profession prescribe one or other of the preparations included in the sulphonamide group for almost every disease to which flesh is heir. This is a very disappointing state of affairs. It is difficult, if not impossible, to ration supplies of these important drugs in any other manner than by placing them on a medical prescription basis. This has been done by the committee, which now repeats and emphasizes the request it has already made to all members of the profession to cooperate in its effort to conserve supplies.

Medical Prizes.

THE STAWELL PRIZE.

THE Medical Secretary of the Victorian Branch of the British Medical Association announces that the Stawell Prize, a memorial to the late Sir Richard Stawell, is open for competition. The amount of the prize is £30. The conditions are as follows:

1. The prize shall be awarded to the writer of the essay adjudged to be the best on a subject selected annually.
2. The subject for 1942 is "The Treatment of Peptic Ulcer".
3. The dissertation should be based on personal observation and experience of the writer.
4. The competition is open to graduates of any Australian university.
5. The trustees reserve the right to withhold the award.
6. Essays must be delivered to the Medical Secretary, British Medical Association (Victorian Branch), by 4 p.m. on July 31, 1942.
7. Each essay must be typewritten or printed, and must not exceed 75,000 words in length.
8. Each essay must be distinguished by a motto and must be accompanied by a sealed envelope marked by the same motto, containing the name and address of the author.
9. The trustees reserve the right to publish the prize essay.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1939, of New South Wales, as duly qualified medical practitioners:

Tyson, Peggy Olive Mary, M.R.C.S., 1941 (England), L.R.C.P., 1941 (London), Bank of New South Wales, Sydney.

Reid, Barbara Colville, M.B., Ch.B., 1931 (Univ. Edinburgh), D.P.H., R.C.P.S. (Edinburgh), R.F.P.S., 1934 (Glasgow), Bank of New South Wales, Sydney.

Barrowman, Barclay, M.B., Ch.B., 1922 (Univ. Glasgow), Moss Vale Road, Bowral.

Hilyard-Smith, Royal, M.R.C.S., 1940 (England), L.R.C.P., 1940 (London), 14, Carrington Road, Randwick.

Leicester, William Samuel, M.R.C.S., 1907 (England), L.R.C.P., 1907 (London), 15, Saint John's Avenue, Gordon.

Marshall, Alexander Joseph, M.B., Ch.B., 1934 (Univ. Saint Andrews), Bank of New South Wales, Sydney.

Wilson, Humbert, Waterfall Sanatorium, Waterfall. Recommended and approved for registration in terms of section 17 (2) of the *Medical Practitioners Act*, 1938-1939.

Grant, Lindsay Ian Hamilton, M.B., B.S., 1941 (Univ. Sydney), 31, Elizabeth Street, Ashfield.

McKenzie, Mavis Hinemoa, M.B., B.S., 1941 (Univ. Sydney), Women's Hospital, Crown Street, Sydney.

Newton, John Hilton, M.B., 1941 (Univ. Sydney), Western Suburbs Hospital, Croydon.

Roberts, Ronald Victor Wallace, M.B., B.S., 1941 (Univ. Sydney), 35, Main Street, Lithgow.

Smith, Arthur Kitchener, M.B., B.S., 1941 (Univ. Sydney), Sydney Hospital, Sydney.

Rutherford, James, M.B., B.S., 1941 (Univ. Sydney), Newcastle Hospital, Newcastle.
Waddy, Nanette Stacy, M.B., B.S., 1941 (Univ. Sydney), Base Hospital, Tamworth.
Whitby, William Thomas, M.B., B.S., 1941 (Univ. Sydney), Jerseyville, Macleay River.

Obituary.

LESLIE JAMES KEIPERT.

We regret to announce the death of Dr. Leslie James Keipert, which occurred on March 8, 1942, at Rupanyup, Victoria.

Nominations and Elections.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Hamp, Edward James Chipp, L.R.C.P. (London), M.R.C.S. (England), 1929, Drouin, Victoria.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Stephens, Max, M.D., 1936 (Univ. Paris), The New Yorker, Roslyn Avenue, Elizabeth Bay.
Syred, Roy Harding, M.B., B.S., 1939 (Univ. Sydney), Royal Hospital for Women, Paddington.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

McLaren, Kathleen Enid, M.B., B.S., 1933 (Univ. Sydney), Kendal Street, Cowra.
Hamilton, Donald Graham, M.B., B.S., 1936 (Univ. Sydney), "Kirriemuir", Church Street, Carlingford.
Dey, David Lindsay, M.B., B.S., 1941 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Friedman, Icyk Mayer (registered January 7, 1942), 234, New South Head Road, Edgecliff.
Rasmussen, Leonard, M.B., B.S., 1941 (Univ. Sydney), "Valhalla", Rectory Avenue, Ashfield.
Joseph, Lynn Harvey, M.B., 1941 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Hegarty, Vincent Henry, M.B., 1941 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.
Swirles, Colin Moorecraft, M.B., B.S., 1941 (Univ. Sydney), Sydney Hospital, Macquarie Street, Sydney.

Medical Appointments.

Dr. Hubert Roger Cope has been appointed a Visiting Surgeon to Goulburn Reformatory, New South Wales.

Books Received.

"Up from the Gates: A Story of Divine Dealing through Dunkirk", by Captain H. E. Beresford Mash, A.D. Corps, H.D.D., R.C.S. (Edinburgh), L.D.S., R.C.S. (England), with a foreword by Captain B. Godfrey Buxton, M.C., M.A. London: Marshall, Morgan and Scott, Limited. Crown 8vo, pp. 80. Price: 1s. 3d. net.

"Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases", by Richard P. Strong, M.D., Sc.D., D.S.M., C.B.; in two volumes; Sixth Edition; 1942. Philadelphia: The Blakiston Company. Crown 8vo, pp. 928 (Volume I) and pp. 923 (Volume II), with coloured plates and 395 illustrations. Price per set: $21.00 net.

"Roentgen Treatment of Infections", by J. F. Kelly, M.D., F.A.C.R., with the collaboration of D. A. Dowell, M.D.; 1942. Chicago: The Year Book Publishers, Incorporated. Medium 8vo, pp. 432, with 122 illustrations and 25 tables. Price: $6.00 net.

"Clinical Roentgenology of Pregnancy", by W. Snow, M.D.; 1942. Springfield: Charles C. Thomas, Publisher. Super royal 8vo, pp. 192, with 119 illustrations and 11 charts. Price: $4.50 net.

"Encephalography" (Monograph Number Two from The Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne), by E. Graeme Robertson, M.D. (Melbourne), M.R.C.P. (London), F.R.A.C.P.; 1941. Melbourne: Macmillan and Company Limited. Crown 4to, pp. 118, with 68 illustrations.

Diary for the Month.

MAR. 31.—New South Wales Branch, B.M.A.: Council.
APR. 1.—Western Australian Branch, B.M.A.: Council.
APR. 2.—South Australian Branch, B.M.A.: Council.
APR. 10.—Queensland Branch, B.M.A.: Council.
APR. 14.—Tasmanian Branch, B.M.A.: Branch.
APR. 15.—Western Australian Branch, B.M.A.: Branch.
APR. 17.—Queensland Branch, B.M.A.: Branch.
APR. 24.—Queensland Branch, B.M.A.: Council.
APR. 24.—Tasmanian Branch, B.M.A.: Council.
APR. 30.—New South Wales Branch, B.M.A.: Branch.
APR. 30.—South Australian Branch, B.M.A.: Branch.

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Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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